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Vol. 947 Number 5

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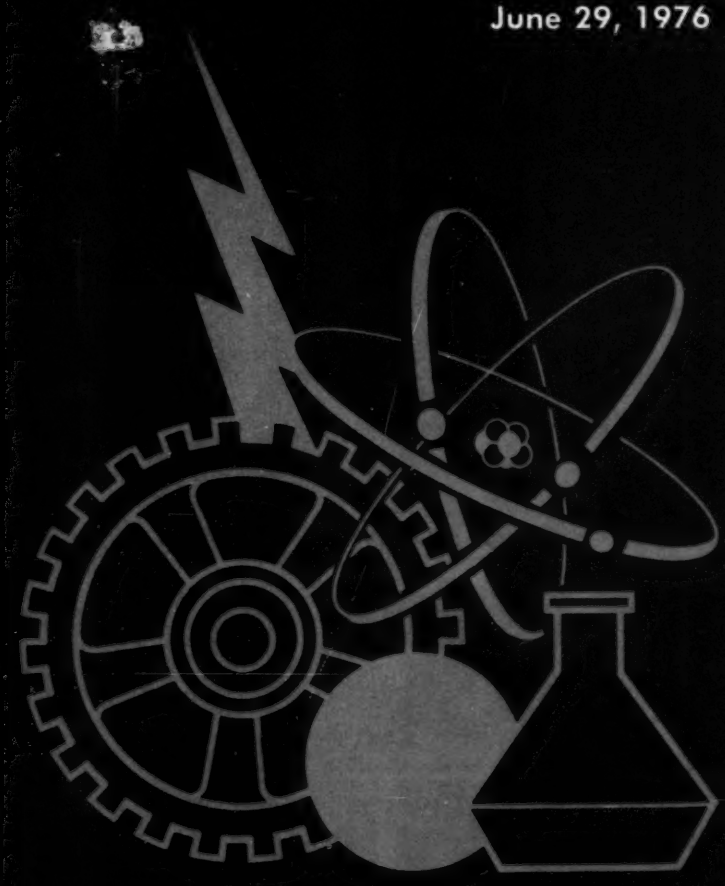
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

June 29, 1976



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

June 29, 1976 Volume 947 Number 5

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $342.20 per annum for first class mailing, also available as fourth-class mail at $250.00; foreign mailing $85.55 additional: single copies $6.60 each.

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The Patent and Trademark Office will use special grant covers with a bicentennial motif on patents issued and trademarks registered, beginning July 6, 1976 and continuing through the last six months of 1976.

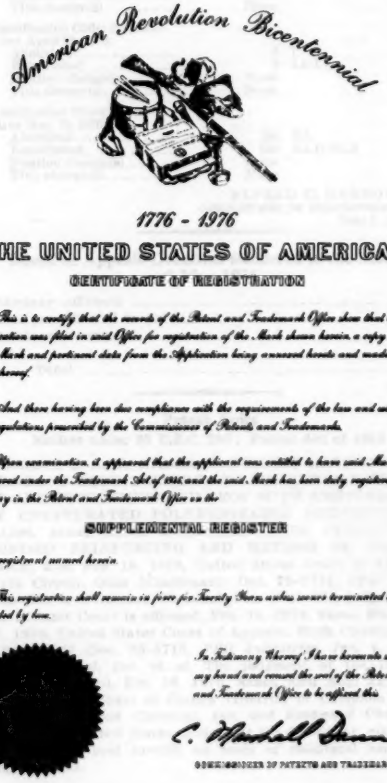
The patent covers will be printed in blue on white paper, with a bicentennial motif, bound with red ribbon and sealed with a gold seal.

The trademark certificate of registration on the Principal Register covers will be printed in blue on white paper with a gold bicentennial motif and sealed with a gold seal. The trademark Certificate of Renewal will be printed in blue on buff paper with a red bicentennial motif and sealed with a red seal. The trademark certificate of registration on the Supplemental Register will be printed in blue on white paper with a blue bicentennial motif and sealed with a blue seal.

Reduced size samples of these special covers are illustrated below.

May 25, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.


American Revolution Bicentennial

1776 - 1976

THE UNITED STATES OF AMERICA

CERTIFICATE OF REGISTRATION

This is to certify that the records of the Patent and Trademark Office show that an application was filed in said Office for registration of the Mark shown herein, a copy of said Mark and pertinent data from the Application being annexed hereto and made a part hereof.

And there having been due compliance with the requirements of the law and with the regulations prescribed by the Commissioner of Patents and Trademarks.

Upon examination it appeared that the applicant was entitled to have said Mark registered under the Trademark Act of 1946 and the said Mark has been duly registered this day in the Patent and Trademark Office on the

SUPPLEMENTAL REGISTER

to the registrant named herein.

This registration shall remain in force for Twenty Years unless sooner terminated as provided by law.

In Testimony Whereof I have hereunto set my hand and caused the seal of the Patent and Trademark Office to be affixed this

C. Marshall Dann

COMMISSIONER OF PATENTS AND TRADEMARKS

AMERICAN REVOLUTION BICENTENNIAL
1776 - 1976

No.

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

WHEREAS THERE HAS BEEN PRESENTED TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

A PETITION PRAYING FOR THE GRANT OF LETTERS PATENT FOR AN ALLEGED NEW AND USEFUL INVENTION THE TITLE AND DESCRIPTION OF WHICH ARE CONTAINED IN THE SPECIFICATIONS OF WHICH A COPY IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PATENT AND TRADEMARK OFFICE IN THE CLAIMANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID CLAIMANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A PATENT UNDER THE LAW.

NOW, THEREFORE, THESE LETTERS PATENT ARE TO GRANT UNTO THE SAID CLAIMANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID CLAIMANT(S) FOR THE TERM OF SEVENTEEN YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF ISSUE FEES AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM MAKING, USING OR SELLING THE SAID INVENTION THROUGHOUT THE UNITED STATES.

IN TESTIMONY WHEREOF I have hereunto set my hand and caused the seal of the PATENT AND TRADEMARK OFFICE to be affixed at the City of Washington this day of in the year of our Lord one thousand nine hundred and seventy-six, and of the Independence of the United States of America the two hundredth and first.

Attest:

Ruth C. Mason
Attesting Officer

C. Marshall Dann
Commissioner of Patents and Trademarks

PATENT AND TRADEMARK OFFICE NOTICES

April and May 1976 Classification Orders

The reclassifications covered by the following classification changes became effective during April and May 1976.

Classification Order 517, effective April 19, 1976:	Class	Subclasses
Abolished	260	78.4; 78.5 and 80-94.9.
Established	260	78.41.
	526	1-352 and 901-916.
	528	480-503.
Position change(s)	None	
Title change(s)	None	

Classification Order 518, effective April 20, 1976:	Design classes	Subclasses
Abolished	D-13; 18; 21; 28; 60 and 68	ALL.
	54	1 and 2.
	92	17.
Established	6	208.1 and 208.2.
	23	138.1.
	(new) 25	1-98.
	34	45.
	92	25-33.
Title change(s)	92	
	6	205.
	8	214 and 225.
	23	94.

Classification Order 519, effective April 20, 1976:		
Abolished	D57	ALL.
	D61	ALL.
Established	D16	1-83.
	D87	9.
Position change(s)	None	
Title change(s)	None	

Classification Order 520, effective April 22, 1976	Class	Subclasses
Abolished	51	163.
Established	51	163.1 and 163.2.
Position change(s)	None	
Title change(s)	None	

Classification Order 521, effective April 28, 1976:		
Abolished	9	1.
Established	9	1.1-1.7.
Position change(s)	None	
Title change(s)	None	

Classification Order 522, effective May 12, 1976:		
Abolished	248	311.
Established	248	311.1; 311.3.
Position change(s)	None	
Title change(s)	None	

ALFRED C. MARMOR
Administrator for Documentation
June 7, 1976

Board of Appeals Decisions Rendered in the Month of May 1976

Examiner affirmed	224
Examiner affirmed in part	50
Examiner reversed	70
Total	344

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,742,378, T. A. Te Grotenhuis, FILLERS HAVING VINYL SILOXANE GROUPS BONDED TO THE SURFACE THEREOF AND COPOLYMERS THEREOF WITH ETHYLENICALLY UNSATURATED POLYMERIZABLE MONOMERS; **2,841,566,** same, HIGH POLYMERS WITH CHEMICALLY BONDED REINFORCING AND METHOD OF MAKING SAME, **filed** Feb. 18, 1976, United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati) Doc. 75-1714, *PPG Industries Inc.* v. *Westwood Chemical, Inc. et al.* The judgment of the District Court is affirmed, Feb. 18, 1976. **Same, filed** Feb. 18, 1976. United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati) Doc. 75-1715, *PPG Industries, Inc.* v. *Westwood Chemical, Inc. et al.* The judgment of the District Court is affirmed, Feb. 18, 1976. **Same, filed** Aug. 22, 1975, United States Court of Claims (District of Columbia) Doc. 473-69, *Westwood Chemical, Inc. and Eastwood Chemical, Inc.* v. *The United States.* Judgment for defendant, claims in both patents held invalid on basis of collateral estopped, Oct. 22, 1975.

2,802,760, Derick and Frosch, OXIDATION OF SEMICONDUCTIVE SURFACES FOR CONTROLLED DIFFUSION, **filed** June 23, 1975, United States Court of Claims (District of Columbia) Doc. 211-75, *Western Electric Company, Incorporated* v. *The United States.*

2,841,566. (See 2,742,378.)

2,869,120, Lolmaugh, Thornton and Smith, TOW TARGET HAVING COMBUSTION SIGNAL MEANS, **filed** June 13, 1975, United States Court of Claims (District of Columbia) Doc. 27-71, *Del Mar Engineering Laboratories* v. *The United States.* In infringement action against U.S., claims 1 to 7 held unpatentable under 35 U.S.C. 102(g) and 103. Petition dismissed, Oct. 22, 1975.

2,873,440, J. B. Speller, ANALOGUE-TO-DIGITAL CONVERTER, **filed** Jan. 16, 1976, United States Court of Claims (District of Columbia) Doc. 13-76, *United Technologies Corporation* v. *The United States.*

2,949,550, T. T. Brown, ELECTROKINETIC APPARATUS; **3,018,394,** same, ELECTROKINETIC TRANSDUCER; **3,517,462,** H. A. Imhof, DEDUCING AND ROUGHING TOOLS, **filed** Jan. 28, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV-76-327-AAH, *Townsend Brown Foundation* v. *Guidance Technology Inc.*

3,018,394. (See 2,949,550.)

3,038,964, A. G. Bose, LOUDSPEAKER SYSTEM; **3,582,553,** same; **Reg. No. 992,982** (MISCELLANEOUS DESIGN), Bose Corporation, **filed** July 12, 1971, D.C., S.D.N.Y., Doc. 71-C-3103, *Bose Corporation* v. *Linear Design Labs., Inc.* Consent judgment and conclusions of law, defendants are hereby enjoined from infringing claims 1, 7, 8 and 11 of '964 and claims 1-10, 12, 13, 15-21, 29-33 of '553, and from infringing upon Registration 992,982, June 20, 1975.

3,038,964, A. G. Bose, LOUDSPEAKER SYSTEM; **3,582,553,** same, **filed** Feb. 26, 1975, D.C. Minn. (Minneapolis) Doc. 4-75-C-89, *Bose Corporation* v. *John Watkins, Jr., doing business as Speakers, Inc. and Watkins Engineering Co.* Case reopened per Judge Larson's order of August 8, 1975.

3,200,396, Stevens and Moritz, CHARACTER READOUT DEVICE, **filed** Nov. 20, 1974, D.C., S.D.N.Y., Doc. 74-C-5093, *General Time Corporation* v. *Sankyo Seiki (America), Inc.* Stipulation of dismissal, claims and actions are hereby dismissed without prejudice, Feb. 3, 1976.

3,253,103, A. J. Fister, PROTECTORS FOR ELECTRIC CIRCUITS; **3,267,240,** T. E. L. Fitzgerald, PROTECTORS FOR ELECTRIC CIRCUITS, **filed** Dec. 17, 1973, D.C., N.D. Ill. (Chicago) Doc. 73c3179, *McGraw-Edison Company* v. *Federal Pacific Electric Company.* By agreement of the parties, case is dismissed with prejudice, Feb. 6, 1976.

3,267,240. (See 3,253,103.)

3,293,668, T. D. Cronin, SURGICALLY IMPLANTABLE HUMAN BREAST PROSTHESIS, **filed** Feb. 27, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c746, *Dow Corning Corporation* v. *American Hospital Supply Corporation and Heyer-Schulte Corp.*

3,325,573, Boon and Hager, MANUFACTURE OF FOAM MATERIAL, **filed** Mar. 22, 1973, D.C. Md. (Baltimore) Doc. HM-74-1251, *Wm. T. Burnett & Company, Inc.* v. *Reeves Brothers, Inc.*

3,339,827, D. J. Steidinger, SEALED ENVELOPE ASSEMBLY WITH INTERIOR MAILING MATERIAL, **filed** Sept. 13, 1974, D.C., N.D. Ill. (Chicago) Doc. 74c2646, *Uarco Incorporated* v. *Wallace Business Forms, Inc.* Case closed in favor of plaintiff, Feb. 13, 1976.

3,431,598, Lueddeke and Lueddeke, MACHINE ORGANIZATION FOR MANUFACTURING TARGET DISCS, **filed** May 20, 1975, D.C.N.J. (Newark) Doc. 75-868, *Eastern Target Co., Inc.* v. *Remington Arms Co., Inc.* Stipulation and order of dismissal of action, Feb. 10, 1976.

3,464,799, C. L. Kimbell, GAS DETECTOR, **filed** Feb. 12, 1976, D.C., N.D. Tex. (Dallas) Doc. CA 3-76-0264, *Houston Atlas, Inc. and Charles L. Kimbell* v. *Del Mar Scientific, Inc. and Robert W. Canterbury.*

3,465,441, L. I. Linkow, RING-TYPE IMPLANT FOR ARTIFICIAL TEETH, filed Aug. 23, 1973, D.C., S.D.N.Y., Doc. 73-C-3667(TPG), *Orantronics, Inc. and Leonard I. Linkow v. Howmedica, Inc.* Filed consent judgment, defendant enjoined permanently, entered Feb. 11, 1974.

3,465,441(a), L. I. Linkow, RING-TYPE IMPLANT FOR ARTIFICIAL TEETH; **3,562,912**, A. E. Edelman, APPLIANCE FOR INSERTING DENTAL IMPLANTS; **3,623,226**, same, METHOD AND APPARATUS FOR INSERTING A DENTAL IMPLANT; **3,702,028**, same, DENTAL IMPLANT EXTRACTING TOOL; **3,729,825**, Linkow, Weiss, Weiss and Liwerant, ORAL IMPLANT; **3,851,393**, Weiss and Lew, same, filed Mar. 10, 1976, D.C.N.J. (Camden) Doc. 75-1683, *Orantronics Inc. and Leonard I. Linkow v. Implant Research Corporation and Alfred E. Edelman.*

3,517,462. (See 2,949,550.)

3,562,912. (See 3,465,441(a).)

3,582,553. (See 3,038,964.)

3,623,226. (See 3,465,441(a).)

3,702,028. (See 3,465,441(a).)

3,729,825. (See 3,465,441(a).)

3,851,393. (See 3,465,441(a).)

Reg. No. 992,982. (See 3,038,964.)

PATENT NOTICES

Certificates of Correction for the Week of June 29, 1976

P.P. 3,854	3,923,407	3,938,102	3,945,800
Re. 28,715	3,923,812	3,938,342	3,945,935
Re. 28,757	3,924,241	3,938,556	3,945,997
Re. 28,775	3,924,398	3,938,672	3,946,009
3,690,891	3,925,067	3,939,062	3,946,037
3,697,865	3,925,270	3,939,110	3,946,059
3,770,774	3,925,338	3,939,180	3,946,096
3,807,335	3,925,485	3,939,412	3,946,200
3,812,664	3,925,553	3,939,854	3,946,335
3,839,166	3,925,560	3,940,477	3,946,389
3,856,664	3,925,780	3,940,599	3,946,435
3,859,331	3,926,237	3,940,614	3,947,505
3,859,421	3,926,691	3,940,748	3,947,507
3,860,066	3,927,963	3,940,839	3,947,545
3,860,428	3,928,542	3,940,885	3,948,323
3,862,169	3,928,553	3,941,150	3,948,386
3,864,220	3,928,598	3,941,381	3,948,481
3,865,985	3,929,604	3,941,624	3,948,497
3,873,598	3,929,822	3,941,709	3,948,655
3,874,280	3,930,031	3,941,777	3,948,816
3,875,116	3,930,348	3,941,806	3,948,921
3,882,484	3,931,263	3,942,218	3,949,124
3,887,519	3,931,317	3,942,477	3,949,139
3,888,100	3,932,495	3,942,499	3,949,317
3,889,137	3,932,550	3,942,500	3,949,417
3,892,190	3,932,587	3,942,815	3,949,468
3,892,928	3,933,507	3,942,868	3,949,483
3,894,606	3,933,741	3,942,926	3,949,507
3,896,035	3,933,935	3,943,111	3,949,921
3,896,741	3,934,044	3,943,149	3,950,043
3,899,500	3,934,181	3,943,152	3,950,082
3,901,078	3,934,182	3,943,454	3,950,208
3,901,603	3,934,353	3,943,624	3,950,241
3,902,454	3,934,513	3,943,815	3,950,444
3,904,796	3,935,236	3,943,841	3,950,457
3,905,134	3,935,545	3,944,074	3,950,575
3,906,804	3,935,646	3,944,150	3,950,592
3,907,468	3,935,900	3,944,385	3,950,985
3,907,596	3,935,910	3,944,561	3,951,122
3,908,025	3,936,266	3,944,740	3,951,200
3,909,781	3,936,356	3,944,786	3,951,309
3,916,308	3,936,577	3,944,800	3,951,419
3,917,621	3,936,823	3,945,141	3,951,456
3,917,669	3,936,910	3,945,146	3,951,542
3,917,885	3,937,431	3,945,160	3,951,632
3,920,054	3,937,690	3,945,210	3,951,747
3,920,752	3,937,701	3,945,272	3,952,119
3,921,397	3,937,716	3,945,299	3,952,213
3,921,458	3,937,761	3,945,400	3,953,946
3,923,149	3,937,921	3,945,605	3,954,426
3,923,277	3,937,950	3,945,677	3,955,044

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 5, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-2-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-12-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	3-14-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-4-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-11-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-1-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-1-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-6-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-5-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-16-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	2-18-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-2-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	11-3-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-26-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-19-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-7-75

Expiration of patents: The patents within the range of numbers indicated below expire during June 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,888,679 to 2,893,004 inclusive
Plant Patents..... Numbers 1,838 to 1,849 inclusive

REISSUES

JUNE 29, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,879

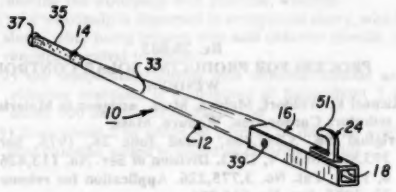
TRACTOR TRAILER FIFTH-WHEEL RELEASE TOOL

Ralph W. Verest, 4515 N. Pulaski Road, Chicago, Ill. 60630

Original No. 3,843,981, dated Oct. 29, 1974, Ser. No. 284,102, Aug. 28, 1972. Application for reissue Dec. 16, 1974, Ser. No. 531,112

Int. Cl.² B25F *1/00*

U.S. Cl. 7—1 G 9 Claims



1. A tool for use on tractor-trailer trucks [employing a load binder having a release handle and] employing a fifth-wheel coupler having a release handle, comprising:

an elongated member rigid throughout its length terminating at its rear end portion in a handle and [terminating at its] *having a* front end portion [in a socket having a recess therein for receiving the load binder handle, the socket being defined by a solid tubular member]; and

a hook [fixedly mounted on and] extending from said front end portion and adapted to engage the fifth-wheel release mechanism handle for moving it to actuate the mechanism, said hook [having a base portion connected to said front end portion and] having a hook-like portion including [a radially-extending upstanding shank portion extending from said base portion,] a reversely-bent smoothly-curved portion extending backwardly [therefrom] and [terminating in] an inclined portion sloping from [the] *its* outermost portion [of said hook] toward said [base] *rear* portion, the distal end portion of said [inclined] *hook-like* portion being blunt in shape and *the innermost portion of said inclined portion* being spaced by a substantial distance from said outermost portion toward said [base] *front* portion.

Re. 28,880

PRINTING MACHINES FEED MECHANISM

Harold Frederick Farrow, Hitchin, England, assignor to Colorflo Limited, Great Britain

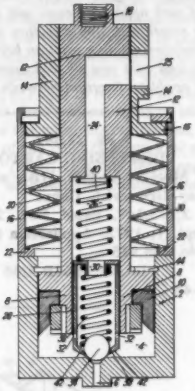
Original No. 3,543,682, dated Dec. 1, 1970, Ser. No. 744,068, July 11, 1968. Application for reissue Feb. 19, 1971, Ser. No. 116,840

Claims priority, application United Kingdom, July 21, 1967, 33735/67

Int. Cl.³ B41F *31/08, 31/18*

U.S. Cl. 101—366 7 Claims

5. A mechanism for use in applying a fluid design onto material comprising a plate having a recessed design therein in accordance with the fluid design to be applied to the material and a passage through the thickness of the plate communicating with said recessed design, a fluid injector unit for delivering a charge of fluid under pressure through said passage to said recessed design when the plate and material are in sealing pressure relationship, said injector unit including a main piston movable in a first chamber to force fluid from said first chamber into said recessed design and means for relieving said pressure of the fluid in said recessed design, said means for relieving the pressure of the fluid in said recessed design comprising a member supported by said piston for yielding movement and having a surface portion exposed to the pressure and which yields in response to a predetermined pressure of the fluid acting thereon to thereby effect said pressure relief, said main piston having a passage



therein through which fluid flows, an auxiliary piston located in said passage, said auxiliary piston having a second chamber communicating with said passage in said main piston and through which fluid flows, means communicating said second chamber and said first chamber to provide for fluid flow therebetween, and said member being carried by said auxiliary piston.

Re. 28,881

BRAKE ADJUSTERS

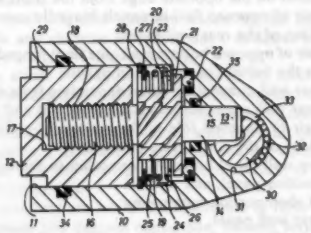
Glyn P. R. Farr, Warwick, England, assignor to Girling Limited, Birmingham, England

Original No. 3,442,357, dated May 6, 1969, Ser. No. 618,914, Feb. 27, 1967. Application for reissue Jan. 10, 1974, Ser. No. 432,359

Claims priority, application United Kingdom, Mar. 18, 1966, 11915/66; May 7, 1966, 20309/66

Int. Cl.³ F16D *65/56*

U.S. Cl. 188—196 D 30 Claims



26. In a vehicle braking system having an automatic adjuster operative between two relatively movable elements actuable to apply a brake: a mechanism of adjustable length for limiting relative travel between said elements upon brake release and comprising first and second members and a non-reversible screw-thread connection between said members; and means for

effecting adjustment and comprising opposed relatively rotatable and axially displaceable means, helically inclined surface means thereon, said opposed means being coaxial with one another and with said non-reversible screw-thread connection and being in interengagement with one another through said helically inclined surface means whereby relative to and fro axial displacement between said opposed means responsive to an excess relative travel between said elements causes relative back and forth rotation between said opposed means, and means for effecting transmission of said relative rotation in one direction only to said first and second members, said last-mentioned means comprising a stepless one way clutch for resisting relative rotation between one of said opposed means and one of said members during relative rotation in one direction between said opposed means and permitting relative rotation between said one of said opposed means and said one of said members during relative rotation in the opposite direction between said opposed means.

Re. 28,882

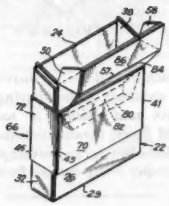
DISPENSING CARTON

David Charles Mueller, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Original No. 3,773,247, dated Nov. 20, 1973, Ser. No. 285,915, Sept. 1, 1972. Application for reissue Feb. 11, 1975, Ser. No. 548,915

Int. Cl.² B65D 5/66

U.S. Cl. 229—44 CB **13 Claims**



1. A two-piece, suitably cut and scored paperboard blank capable of being erected into a dispensing carton, comprising a slide receptacle portion and a shell portion, said slide receptacle portion comprising:

a front wall panel;

a pair of opposed side wall panels hingedly connected to the sides of the front wall panel;

a bottom wall panel hingedly connected to the bottom of the front wall panel;

a rear wall panel hingedly connected to the bottom wall panel on the opposite edge from the front wall panel;

a pair of opposed fold-in panels hingedly connected to the sides of the rear wall panel;

a pair of opposed bottom wall glue flaps hingedly connected to the bottom of the fold-in panels;

a rear wall connecting panel depending from the top of the rear wall panel across an alternate cut and crease line;

a pair of opposed fold-in flaps hingedly connected to the sides of the connecting panel; and

a top wall panel hingedly connected to the top of the connecting panel; and

said shell portion comprising:

a rear wall panel;

a pair of opposed side wall panels hingedly connected to the sides of the rear wall panel;

a front wall panel hingedly connected to one of the side wall panels and extending laterally therefrom;

a side wall panel glue flap hingedly connected to the front wall panel and extending laterally therefrom;

a foldover panel hingedly connected to the top edge of the rear wall panel;

at least one folding panel hingedly connected to and extending from the edge of the foldover panel parallel to rear wall panel top edge;

a hinge *panel* extending longitudinally from and hingedly connected to the adjacent folding panel; and

a glue panel extending longitudinally from and hingedly connected to the hinge panel.

Re. 28,883

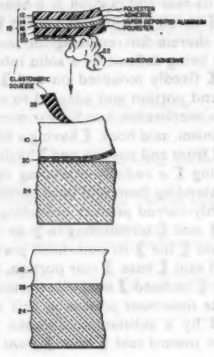
PROCESS FOR PRODUCING SOLAR CONTROL WINDOW

Michael E. Willdorf, Malden, Mass., assignor to Material Distributors Corporation, Woburn, Mass.

Original No. 3,891,486, dated June 24, 1975, Ser. No. 393,806, Sept. 4, 1973. Division of Ser. No. 113,426, Feb. 8, 1971, Pat. No. 3,775,226. Application for reissue Sept. 22, 1975, Ser. No. 615,376

Int. Cl.² B32B 17/06

U.S. Cl. 156—71 **5 Claims**



1. A process for producing a solar control window, said process comprising the steps of superposing a semi-transparent solar control film upon a window surface with an aqueous detergent interposed therebetween, said solar control surface comprising in laminated sequence, an optically clear silicone release stratum, an optically clear polyester support stratum, an optically clear polyester bonding stratum, a semi-transparent vapor deposited aluminum stratum, an optically clear polyester support stratum, and an optically clear pressure sensitive stratum being in contiguity with said window surface, said release stratum being remote from said window surface, squeegeeing said solar control film into intimate contact with said window surface while said pressure sensitive adhesive stratum is deactivated by said aqueous detergent, and permeating said aqueous detergent out of the interface between said pressure sensitive stratum said window surface in order to reactivate said pressure sensitive adhesive stratum.

Re. 28,884

WOODPULP BLEACHING PROCESS

Walter Q. Jack, and Loyd V. Johnson, both of Tacoma, Wash., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Original No. 3,433,702, dated Mar. 18, 1969, Ser. No. 467,697, June 28, 1965. Application for reissue July 2, 1975, Ser. No. 592,487

Int. Cl.[3] D21C 9/12, 9/14

U.S. Cl. 162—66 10 Claims

1. A process for the bleaching of woodpulp, comprising:

(a) reacting woodpulp with chlorine dioxide until said chlorine dioxide is [at least partially] *more than 50 percent* depleted and [,] thereafter, *without an intermediate wash*,

(b) reacting the woodpulp with chlorine, wherein

(1) the woodpulp is dispersed in an aqueous slurry, which slurry, after being treated with said chlorine dioxide, is rendered neutral to acidic;

(2) the temperature during said chlorine dioxide and chlorine reactions is maintained at from about 5 to about 100 degrees centigrade; and

(3) from about 2 to about 90 percent of the total available chlorine added is added as chlorine dioxide.

Re. 28,885

METHOD FOR ISOMERIZING GLUCOSE SYRUPS

William P. Cotter; Norman E. Lloyd, both of Clinton; Charles W. Hinman, deceased, late of Clinton, by Roy W. Deitchler, administrator, Fort Madison, all of Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

Original No. 3,623,953, dated Nov. 30, 1971, Ser. No. 765,654, Oct. 7, 1968. Application for reissue Oct. 25, 1972, Ser. No. 300,687

Int. Cl.[3] C12D 13/00

U.S. Cl. 195—31 F 12 Claims

1. A process for enzymatically isomerizing glucose in a glucose-containing liquor to fructose comprising providing a glucose-isomerizing enzyme in a glucose-containing liquor and subjecting the liquor to isomerizing conditions, there being present in the glucose-containing liquor during isomerization a small amount of a water-soluble salt of sulfurous acid sufficient to measurably reduce the formation of color bodies below that level obtained by carrying out the enzymatic isomerization without the presence of the water-soluble salt of sulfurous acid.

10. A process for enzymatically isomerizing glucose in a glucose-containing liquor to fructose comprising providing a glucose-isomerizing enzyme in a glucose-containing liquor and subjecting the liquor to isomerizing conditions, there being present in the glucose-containing liquor during isomerization an amount of a water-soluble salt of sulfurous acid sufficient to reduce denaturation of the glucose-isomerizing enzyme below that level occurring when the enzymatic isomerizaton is carried out without the presence of the water-soluble salt of sulfurous acid.

Re. 28,886

METHOD FOR PREPARING CYTIDINE DIPHOSPHATE CHOLINE

Kiyoshi Nakayama, Sagamihara, and Hiroshi Hagino, Tokyo, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Original No. 3,684,652, dated Aug. 15, 1972, Ser. No. 60,743, Aug. 3, 1970. Application for reissue June 4, 1973, Ser. No. 366,263

Claims priority, application Japan, Aug. 4, 1969, 44-60999

Int. Cl.[3] C12D 13/06

U.S. Cl. 195—28 N 13 Claims

14. A method for preparing cytidine diphosphate choline which comprises culturing an aqueous reaction liquor containing (a) at least one of the class consisting of choline and phosphoryl choline; (b) at least one of the class consisting of cytidine, cytidine-5'-monophosphate, cytidine-5'-diphosphate and cytidine-5'-triphosphate; (c) cells of bacteria or molds that are in a form which liberate their enzyme systems into the aqueous reaction liquor under the culturing conditions; (d) phosphate ion (e) at least one of the class consisting of magnesium ion and manganese ion; (f) at least one fermentable sugar and recovering cytidine diphosphate choline from said culture liquor.

Re. 28,887

SEQUENTIAL BLEACHING OF KRAFT PULP WITH CHLORINE DIOXIDE FOLLOWED BY CHLORINE

Walter Q. Jack, Youngstown, N.Y., and Loyd V. Johnson, Tacoma, Wash., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Original No. 3,501,374, dated Mar. 17, 1970, Ser. No. 787,267, Dec. 26, 1968. Continuation-in-part of Ser. No. 467,697, June 28, 1965, Pat. No. 3,433,702, no Re. 28,884. Application for reissue July 2, 1975, Ser. No. 592,486

The portion of the term of this patent subsequent to Mar. 18, 1986 has been disclaimed

Int. Cl.[3] D21C 9/12, 9/14

U.S. Cl. 162—66 10 Claims

1. A process for the sequential bleaching of kraft pulp, comprising the steps of sequentially:

(a) reacting kraft pulp dispersed in aqueous slurry with chlorine dioxide until the chlorine dioxide is [at least partially] *more than 50 percent* depleted, and then reacting the kraft pulp with chlorine, *without an intermediate wash*, wherein:

(1) the total available chlorine added by the chlorine dioxide and chlorine is from about 1 to about 10 percent by weight of the kraft pulp,

(2) from about 5 to about 90 percent of the total available chlorine is furnished by chlorine dioxide, the remaining available chlorine being furnished by chlorine,

(3) the chlorine dioxide is reacted with the kraft pulp for from about 2 to about 75 minutes, and the chlorine is reacted with the kraft pulp for from about 2 to about 120 minutes, and

(4) the reactions are run at a temperature of from about 0 to about 100 degrees centigrade, thereby forming a neutral to acidic slurry of pulp material with a consistency of from about 2 to about 20 percent (by weight of pulp); and

(b) treating said slurry of pulp material with caustic at a temperature of from about 0 to about 100 degrees centigrade for about 15 minutes to about 3 hours until the pH of the slurry is from about 7 to about 12.

Re. 28,888

COOKING TIME ADJUSTING ARRANGEMENT FOR USE IN ELECTRONIC OVEN

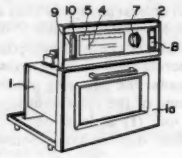
Fumiko Mori, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Original No. 3,848,105, dated Nov. 12, 1974, Ser. No. 346,795, Apr. 2, 1973. Application for reissue July 11, 1975, Ser. No. 595,302

Claims priority, application Japan, Apr. 6, 1972, 47-41112[U]; Apr. 6, 1972, 47-41113[U]

Int. Cl.[2] H05B 9/06

U.S. Cl. 219—10.55 B 15 Claims



1. A cooking time adjusting arrangement for use in an electronic oven, said arrangement being utilized in an electronic oven including an oven-defining structure having an access opening, means positioned for generating high frequency energy toward the interior of said oven-defining structure and a hingedly supported door for [selectively] covering the access opening of said oven-defining structure, said adjusting arrangement comprising:

a timer device having an operating shaft for setting the timer to any desired operating period, said means for generating high frequency energy being operatively coupled to said timer device and operating during said operation period;

an instrument panel having a front and back and positioned on said oven-defining structure and having a window portion and an aperture therein, said timer device being positioned adjacent the back of said panel and said operating shaft of said timer extending through said aperture;

a movable pointer needle, operatively coupled to said operating shaft and positioned to move along said window portion for indicating the operating time of said means for generating high frequency energy; and

display means positioned behind said window portion for visually representing various information relating to menus, corresponding cooking times and operating time, said display means comprised of a rotatable drum, the peripheral surface thereof having said information thereon.

PLANT PATENTS

GRANTED JUNE 29, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,926
ROSE PLANT—MEINASTUR VARIETY

Marie-Louise Meilland and Alain A. Meilland, Antibes, and Michele Meilland Richardier, Tass-in-la-Demi-Lune, France, assignors to The Conard-Pyle Company, West Grove, Pa.

Filed Oct. 24, 1974, Ser. No. 517,818

Claims priority, application Morocco, Dec. 7, 1973, 16,624

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class substantially as illustrated and described, distinguished as to novelty, from the physical point of view, the plant, with medium green adult wood, is erect, the flower is semi-double, bright vermilion inside, crimson outside, the petals are very firm and show a yellowish white unguis, from the biological point of view, this rose plant is of vigorous growth, has great aptitude to forcing, its flowers last a long time when cut and their petals drop off cleanly.

3,927
APRICOT TREE

Raymond C. Freimann, Tieton, Wash., assignor to Stark Brothers Nurseries & Orchards Company, Louisiana, Mo.

Filed Feb. 26, 1975, Ser. No. 553,211

Int. Cl.[2] A01H *5/08*

U.S. Cl. Plt.—39 **1 Claim**

1. A new and distinct variety of apricot tree, substantially as herein shown and described, characterized particularly as to novelty by being appreciably larger in size than the Tilton apricot.

3,928
PEAR TREE

Louis F. Johnson, deceased, late of Ukiah, Calif., by Margaret M. Johnson, administratrix, Ukiah, Calif., assignor to Stark Brothers Nurseries & Orchards Company, Louisiana, Mo.

Filed Mar. 5, 1975, Ser. No. 555,449

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—36 **1 Claim**

1. A new and distinct variety of pear tree substantially as herein shown and described, characterized particularly as to novelty by its fruit being appreciably larger in size than the Bartlett, not as pyriform in shape and more roundish with a distinct neck, while the tree is more compact than the Bartlett tree.

3,929
GRAPEVINE

Harold P. Olmo, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed May 15, 1975, Ser. No. 577,974

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—47 **1 Claim**

1. The new and distinct variety of grapevine herein described and illustrated and identified by the characteristics enumerated above.

3,930
IMPATIENS PLANT

Claude Hope and Rafael Angel Montoya Murillo, Cartago, Costa Rica, assignors to Goldsmith Seeds Inc., Gilroy, Calif.

Filed June 16, 1975, Ser. No. 587,439

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive cultivar of *Impatiens sultani*, substantially as herein shown and described, characterized particularly as to novelty by its large, highly double flowers and distinct bright clear rose color.

PLANT PATENTS

GRANTED JUNE 29, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce them.

3,918
PEAR TREE

Frank E. Johnson, deceased, late of Ukiah, Calif., by Margaret M. Johnson, administratrix, Ukiah, Calif., assignor to Stark Brothers Nurseries & Orchards Company, Louisiana, Mo.

Filed Mar. 5, 1975, Ser. No. 555,469
Int. Cl.² A01H 5/03

U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of pear tree substantially as herein shown and described, characterized particularly as to novelty by its fruit being appreciably larger in size than the Bartlett, not as pyriform in shape, and more rounded with a distinct neck, while the tree is more vigorous than the Bartlett tree.

3,919
GRAPEVINE

Harold P. Olmo, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed May 15, 1975, Ser. No. 577,974
Int. Cl.² A01H 5/03

U.S. Cl. Plt.—47 1 Claim

1. The new and distinct variety of grapevine herein described and illustrated and identified by the characteristics enumerated above.

3,920
IMPATIENS PLANT

Claude Hope and Rafael Angel Montero Umaña, Cartago, Costa Rica, assignors to Goldsmith Seeds Inc., Gilroy, Calif.

Filed June 16, 1975, Ser. No. 587,439
Int. Cl.² A01H 5/00

U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive cultivar of Impatiens sultanii substantially as herein shown and described, characterized particularly as to novelty by its large, highly double flowers and distinct bright clear rose color.

3,921
ROSE PLANT—MEICASTLER VARIETY

Marie-Louise Meilland and Alain A. Meilland, Antibes, and Michele Meilland Richardier, Tassin la Demi-Lune, France, assignors to The Conard-Pyle Company, West Grove, Pa.

Filed Oct. 21, 1974, Ser. No. 517,013
Claims priority, application Germany, Dec. 7, 1973, 18,026
Int. Cl.² A01H 5/00

U.S. Cl. Plt.—20 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class substantially as illustrated and described, distinguished as to novelty, from the horticultural point of view, the plant, with medium green adult wood, is erect, the flower is semi-double, bright vermilion inside, crimson outside, the petals are very firm and show a yellowish white unguis, from the biological point of view, this rose plant is of vigorous growth, has great aptitude to forcing, its flowers last a long time when cut and their petals drop off cleanly.

3,922
APRICOT TREE

Raymond C. Friedmann, Tieton, Wash., assignor to Stark Brothers Nurseries & Orchards Company, Louisiana, Mo.

Filed Feb. 24, 1975, Ser. No. 553,211
Int. Cl.² A01H 5/03

U.S. Cl. Plt.—39 1 Claim

1. A new and distinct variety of apricot tree substantially as herein shown and described, characterized particularly as to novelty by fruits appreciably larger in size than the Tilton apricot.

PATENTS

GRANTED JUNE 29, 1976

ERRATA

For CLASS	See PATENT NO.
272–104	3,965,507
084–077	3,965,794
151–005	3,965,954
052–753	3,965,958
104–275	3,965,967
043–021.2	3,966,151
061–013	3,966,233
308–235	3,966,284
162–013	3,966,540
260–429 R	3,966,595
526–306	3,966,689
526–283	3,966,690
526–078	3,966,691
526–020	3,966,692
526–075	3,966,693
526–011.2	3,966,694
526–062	3,966,695
526–199	3,966,696
526–093	3,966,697
252–465	3,966,790
261–064 R	3,966,854
261–092	3,966,859
424–052	3,966,863
260–668 D	3,966,895
195–103.7	3,966,896
423–112	3,966,909
264–118	3,966,912
424–317	3,966,978
252–500	3,966,987
423–626	3,966,996
340–415	3,967,281
357–038	3,967,294
357–051	3,967,295
357–080	3,967,296

PATENTS

GRANTED JUNE 29, 1976

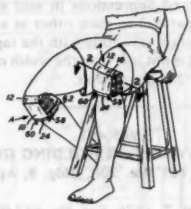
ERRATA

PATENTS

GRANTED JUNE 29, 1976

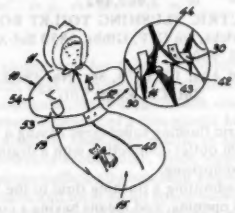
GENERAL AND MECHANICAL

3,965,486
PNEUMATIC KNEE PAD
Charles S. Lightbody, 125 W. Third St., Duluth, Minn. 55802
Filed Feb. 5, 1975, Ser. No. 547,209
Int. Cl.[2] A41D *13/06*
U.S. Cl. 2—24 **1 Claim**



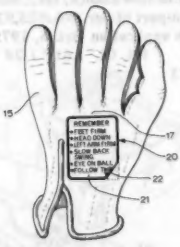
1. A pneumatic knee pad comprising:
a. a main hollow body portion including spaced side walls connected to
b. a front wall and
c. a rear wall spaced from said front wall,
d. a top wall connected to said side walls and said front and rear walls and
e. a bottom wall connected to side walls and said front and rear walls,
f. a central wall connected internally of said front and rear walls and said top and bottom walls dividing said hollow body into first and second chambers,
g. a plurality of spaced hollow fingers extending at substantially right angles from and communicating with the first chamber,
h. a plurality of hollow fingers extending at substantially right angles from and communicating with the second chamber,
i. means for attaching the pad to the knee of a user, and
j. means for inflating each of said first and second chambers with air which also inflates said communicating fingers, the air in the chambers is being forced into the fingers when the chamber is deformed to hold the knee joint parts together.

3,965,487
MULTI-USE INFANT GARMENT
Adella Mazur, 9 Holtham St., Hampstead H3X 3N2, Canada .
Filed Dec. 13, 1974, Ser. No. 532,642
Int. Cl.[2] A41D *11/00, 15/04*
U.S. Cl. 2—69.5 **1 Claim**



1. A multi-use infant garment comprising an upper garment having at least a chest section and a back section, said upper garment defining a lower edge, a lower garment, said lower garment being detachably secured to said upper garment by a slide fastener consisting of two interlocking bands each having interlocking elements in an elongated edge thereof, a slide housing for causing engagement and disengagement of said interlocking elements in opposed bands, one of said bands being secured to said upper garment in the vicinity of said lower edge and the other of said bands being secured in an upper edge of said lower garment, said band secured to said inner surface of said upper garment being spaced inwardly from said lower edge to define a marginal band portion between said lower edge and said fastening means, said marginal band extending over and concealing said slide fastener, said upper garment having a closeable vertical opening extending from adjacent said lower edge to a neck opening, a second slide fastener for closing said vertical opening, said marginal band portion defining a belt portion extending beyond a vertical edge of said vertical opening whereby to overlap the band portion terminating at the opposed vertical edge of said vertical opening, and means to secure said overhanging belt portion to an outer surface portion of said band portion, said lower garment comprising a lower bag-like garment having an upper edge secured to said upper garment by said slide fastener, a closeable opening in said bag-like garment and extending substantially transverse to said upper edge and depending therefrom, said closeable opening being aligned with said closeable vertical opening of said upper portion and also closeable by a third slide fastener, all of said slide fasteners having an end terminating substantially centrally on the front of said infant garment whereby the garment sections can be detached from a central location in front of the garment where the slide housings meet, said upper garment being further provided with arm portions, said arm portions having a hand opening, at least one fastener secured adjacent said hand opening to retain a mitten about said hand opening, and a hood about a portion of a neck opening.

3,965,488
GOLF AID
Jeno F. Paulucci, 6 Minneapolis Ave., Duluth, Minn. 55806
Filed June 5, 1974, Ser. No. 476,428
Int. Cl.[2] A41D *19/00*
U.S. Cl. 2—161 A **2 Claims**



1. A golf glove for the left hand of a righthanded golfer or the right hand of a lefthanded golfer, constructed wherein:
a. said glove has a relatively smooth back which, when the golfer grips the golf club properly and addresses the ball, includes a portion immediately to the rear of the golfer's thumb and forefinger facing upwardly toward the golfer's eyes,
b. a strip of flexible material elongated on one axis,
c. indicia in the form of instructive words or phrases provided on one side of said strip extending transversely of said axis so that they can be read easily and accurately

only with the golfer's eyes looking along said axis from one end of said strip, and

d. means on the other side of said strip for releasably fastening said strip to said back portion with said axis of said strip extending upwardly from and generally parallel to the golfer's index finger,

e. said strip normally being fastened to said back portion with said one end of said strip being disposed away from the index finger and toward the golfer's eyes.

3,965,489

ENDOPROSTHETIC BONE JOINT DEVICE FOR THE TALO-NAVICULAR JOINT

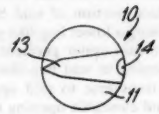
Michael Alexander Reykers Freeman, London; Geoffrey Edward Kempson, Flackwell Heath, and Michael Anthony Tuke, Sutton, all of England, assignors to National Research Development Corporation, London, England

Filed Apr. 9, 1975, Ser. No. 566,431

Claims priority, application United Kingdom, Apr. 11, 1974, 16182/74

Int. Cl.² A61F 1/24

U.S. Cl. 3—1.91 **6 Claims**



1. An endoprosthetic talo-navicular joint device comprising: a talar component in the form of a disc having one face convexly curved to define a bearing surface, and the other face provided with a relieved configuration of elongated shape across such face but relatively shallow depth, said configuration including a rib which is longitudinally convergently tapered towards one end thereof and extends across said other face; and a navicular component of similar form to said talar component, but with the bearing surface of the former being concave and generally complementary to that of the latter for mutual articulatory bearing engagement therebetween.

3,965,490

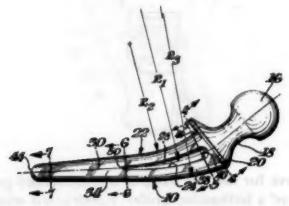
FEMORAL INSERT FOR HIP JOINT PROSTHESIS

Ian P. Murray, Hewitt, and Mark R. Forte, Pinebrook, both of N.J., assignors to Howmedica, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 523,926, Nov. 14, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 619,622

Int. Cl.² A61F 1/24

U.S. Cl. 3—1.913 **28 Claims**



1. A femoral insert for a hip joint prosthesis comprising a spherical head, a longitudinally tapered stem adapted for insertion within the femur connected to said spherical head, a neck connected to said spherical head, a collar disposed between said neck and said stem for limiting the insertion of said stem within said femur, said stem having a curved proximal axis and a straight distal axis merging into each other to constitute a bent major axis disposed in an axial plane, said stem having throughout its proximal length substantially ellipsoidal transverse cross-sections with longer sides than widths disposed substantially parallel to said axial plane, said ellipsoidal cross-sections being disposed substantially perpendicular to said bent major axis, at least one curved teardrop-shaped depression disposed symmetrically about a lateral extension of said curved proximal axis in each of said sides, said depression tapering from a maximum width at the proximal end to a convergent tail at the distal end, the proximal and distal sides of said stem tapering in width uniformly from the proximal to distal ends of said stem, and the bases of said curved teardrop-shaped depressions in said sides being disposed substantially parallel to each other at a distance from each other which merges smoothly with the tapering outsides of said distal end and is not less than the width of the distal end adjacent said tail of said depression.

3,965,491

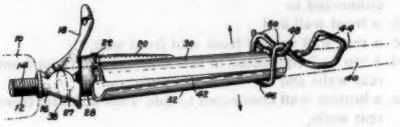
PROSTHETIC DEVICE FOR HOLDING GOLF CLUBS

William K. Frenzel, 151 Rte. 206, Bldg. 8, Apt. 3, Flanders, N.J. 07836

Filed Jan. 7, 1976, Ser. No. 647,058

Int. Cl.² A61F 1/06

U.S. Cl. 3—12.8 **8 Claims**



1. A prosthetic arm device comprising:

a base member adapted to be coupled to a prosthetic arm socket member, said base member including a mounting member, a shaft extending from said mounting member and adapted to be detachably secured to said arm socket member, a control lever pivotably secured to said mounting member, a pair of adjacent support members extending respectively from said control lever and said mounting member, and resilient means urging said control lever and said support members to maintain a closed position;

a pair of tapered tubular sleeve sections secured to and extending longitudinally from respective said support members, said control member being adapted to open said sleeves against the force of said resilient means to receive a handle of a club therebetween, said sleeves being adapted to engage said handle upon return to said closed position; and

locking means on said sleeves to fixedly clamp said sleeve sections together around said handle.

3,965,492

ELECTRIC FLUSHING TOILET BOWL

Victor P. Hendricks, c/o G. F. Gibbs, 1850 Bel-Aire Road, Los Angeles, Calif. 90024

Filed Aug. 12, 1974, Ser. No. 496,520

Int. Cl.² E03D 5/012

U.S. Cl. 4—79 **8 Claims**

1. In an electric flushing toilet bowl having a top rim opening and a bottom outlet connection with a drain line trap, the improvement comprising:

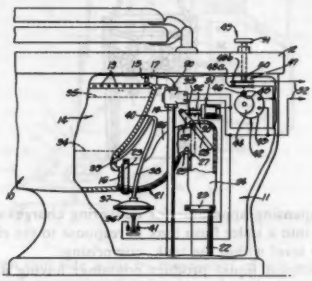
a. means for admitting a flushing fluid to the bowl adjacent the top rim opening, said means having a connection with a fluid source;

b. normally closed first valve means for controlling said fluid source connection;

c. normally open second valve means for controlling the outlet connection of said bowl;

d. manually operable switching means for initiating a flushing operation; and

e. means for controlling actuation of said first and second valve means, including electric timing means having an energizing circuit controlled by said switching means and being energizable in response to the operation of said switching means, for effecting a cycle of sequential operations as follows:



1. to open said first valve means and close the second valve means so as to provide a raised fluid level in said bowl,

2. to open said second valve means in response to the raised fluid level in said bowl so as to utilize the fluid at the raised fluid level in the bowl for flushing the bowl, and

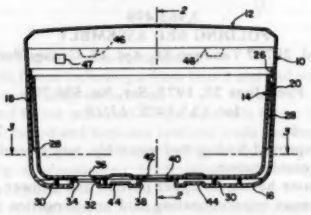
3. after a time interval close the first valve means.

3,965,493

WATER CLOSET TANK

Richard A. Bemis, Sheboygan, Wis., assignor to Bemis Manufacturing Company, Sheboygan, Wis.

Filed Mar. 12, 1975, Ser. No. 557,706
Int. Cl.² E03D *1/20, 11/00, 1/01*
U.S. Cl. 4—18 R **15 Claims**



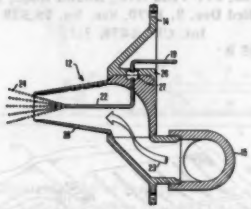
1. A water closet tank for toilets, comprising: tank means formed of a thin, rigid, high-impact strength plastic, including a generally-rectangular, open-topped tank and a cover therefor; and liner means formed of a thin plastic having a substantially greater pliability than said plastic of said tank means, including a generally-rectangular, open-topped liner having overall dimensions sufficiently less than those of said tank to fit within said tank and form an air space between the bottoms and side walls of said liner and said tank and an upper rim extended outwardly and offset from the remaining portion of said liner a sufficient distance to contact the inside of said side walls of said tank, said pliability of said liner being sufficient to form a nearly air-tight seal between said upper rim of said liner and said inside of said side walls of said tank.

3,965,494

REDUCED LIQUID CONSUMPTION CLEANING APPARATUS

Larry K. Baker, Mokelumne Hill, Calif.

Continuation of Ser. No. 281,216, Aug. 16, 1972, abandoned.
This application June 28, 1974, Ser. No. 484,076
Int. Cl.² A61H *33/02*
U.S. Cl. 4—145 **15 Claims**



1. A reduced liquid consumption cleaning system, comprising:

Means for supplying a cleaning liquid under pressure;

Means for supplying a gas under pressure;

An enclosure for containing a surface to be cleaned,

Means connected to said liquid supply means and said gas supply means for entraining droplets of said cleaning liquid on a stream of said pressurized gas, said entraining means comprising:

a first passageway for said pressurized gas;

a second passageway for said cleaning liquid, said second passageway being substantially parallel to said first passageway in said entraining means to provide an effective cleaning spray with reduced liquid consumption in said enclosure; and

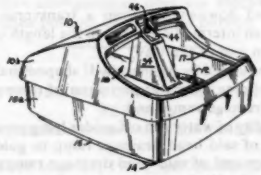
Means connected between said enclosure and said gas supply means for recirculating a portion of said stream of pressurized gas.

3,965,495

HYDROTHERAPY FOOT TUB HAVING HEATING AND MASSAGING MEANS

Samuel L. McNair, Kansas City, Mo., assignor to Dazey Products Company, Kansas City, Mo.

Filed June 2, 1975, Ser. No. 582,777
Int. Cl.³ A47K *3/022, 3/10*
U.S. Cl. 4—182 **7 Claims**



1. Foot tub apparatus comprising:

a casing presenting a tub for receiving and containing liquid, said tub having a floor with foot spaces;

a heater housing supported between said foot spaces, said housing including generally upright walls extending upwardly from said floor and a top panel spaced above said floor, said walls and top panel cooperating to define a substantially enclosed chamber;

a heating element operable to emit heat;

a container member constructed of heat conducting material and lesser in size than said heater housing so that the exterior of said container member is spaced from the

walls and top panel of said housing, said container member having said heating element therein; and

means for mounting said container member within said heater housing.

3,965,496

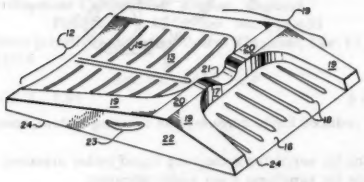
PORTABLE BABY BATHING AND SHAMPOOING TRAY

Georgia I. Grelle, 211 Vista Ave., Round Rock, Tex. 78664

Filed Dec. 9, 1970, Ser. No. 96,528

Int. Cl.[2] A47K *3/12*

U.S. Cl. 4—185 B 1 Claim



1. An improved portable baby bathing and shampooing tray adapted to rest on a substantially flat surface, including drain provisions, said tray comprising:

A. a base perimeter adapted to rest on a substantially flat surface;

B. an inclined body supporting and drainage ramp, said body supporting and drainage ramp

1. occupying about two-thirds of the length of the tray,

2. being inclined upwardly from its outside lower extremity to an elevated ridge lying transversely across the tray at an intermediate point in the length of the tray,

3. having a longitudinal concave body receiving depression along the center of said body supporting and drainage ramp, and

4. having a longitudinally positioned drainage groove positioned down the center of said concave body depressions;

C. a head supporting and shampooing drainage ramp longitudinally spaced apart from said body drainage ramp, said head supporting and shampooing drainage ramp

1. occupying almost one-third of the length of said baby bathing tray,

2. inclined downwardly from a transverse ridge lying across an intermediate point in the length of the tray to an open end of the tray,

3. being bounded by a generally U shaped shallow vertical wall defining the outer perimeter of three sides of said head drainage ramp, and

4. a plurality of water run off guides lying parallel with the length of said head drainage ramp to guide liquids to the open end of said head drainage ramp;

D. a generally H shaped structure forming an elevated perimeter around three sides of each of the longitudinally spaced ramps with an elevated transverse ridge occupying the space between the upper ends of the two inclined spaced apart ramps and a concave neck receiving depression being provided in the transverse ridge portion of said perimeter structure;

E. inwardly inclined side walls rising from the base of the tray to enclose the left and right longitudinal sides of said trays and supporting the outside edge of said H shaped perimeter structure; and

F. hand hold carrying means comprising shaped openings being provided in each of the side walls of said improved baby bathing and shampooing tray.

3,965,497

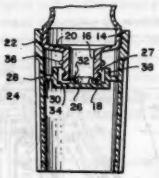
TOILET CHEMICAL DISPENSER

Douglas F. Corsette, 6559 Firebrand St., Los Angeles, Calif. 90045

Filed June 17, 1975, Ser. No. 587,640

Int. Cl.[2] E03D *9/02*, *9/03*

U.S. Cl. 4—227 15 Claims



1. Dispensing apparatus for delivering charges of a liquid product into a toilet flush tank in response to the rise and fall of water level within the tank, comprising:

an enclosed liquid product container having a discharge spout directed downwardly therefrom;

a dispensing closure for said container comprising a sleeve encircling and spaced from said spout and having an upper end connected to said container in substantially fluid tight manner for vertical adjustment relative to said spout;

a metering and sealing cup supported within said sleeve, said cup being normally spaced beneath said spout for Vertical movement with said sleeve into sealing engagement with said spout and including an upstanding wall encircling and spaced from the lower end of said spout;

said sleeve having a downwardly opening lower end projecting below said cup for communication with the water within said tank;

said downwardly opening lower end being in communication with said cup through a passage extending externally of the cup and opening into said cup above the bottom thereof, for exposing the surface of the liquid product within the cup to the air pressure within the sleeve and for discharging overflowing liquid product from the cup by gravity into said tank.

3,965,498

FOLDING BED ASSEMBLY

Miklos Boni, 20717 Vanowen St., Apt. 18, Canoga Park, Calif. 91306

Filed June 20, 1975, Ser. No. 588,794

Int. Cl.[2] A47C *13/38*

U.S. Cl. 5—6 7 Claims

1. An improved folding bed assembly, said assembly comprising, in combination:

a bed frame having an upper portion and a lower portion,

hinge means interconnecting said upper portion and said lower portion,

a mattress supported by said bed frame and adapted to be foldable thereon,

a storage cabinet having interconnected side walls,

at least one elongated lever arm,

one end of said level arm being pivotally connected to a first side of said upper portion of said bed frame near the top thereof,

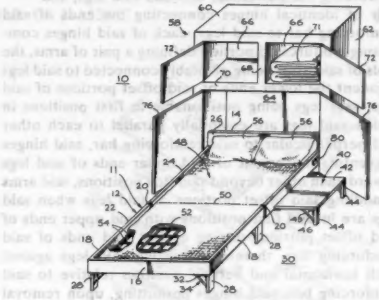
the opposite end of said lever arm being pivotally connected to the rear, lower end of one of said side walls,

said lever arm extending generally horizontally at about the level of said bed frame when said bed frame is in an operative position,

whereby the lower portion of the bed frame is adapted to be folded over the upper portion of said bed frame with the folded mattress therebetween to result in a compacted

bed assembly having about one half the length of the bed frame in its operative position,

wherein said compacted bed assembly is adapted to be moved into a substantially vertical position and located



between said side walls by movement of one end of said level arm upward and towards said walls in an arcuate path extending about the pivot point of the opposite end of said lever arm and said one of said side walls,

whereby said bed assembly is stored between said side walls.

3,965,499

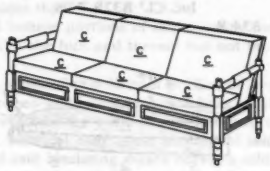
CONVERTIBLE SOFA

John M. Dunning, III, Greensboro, N.C., assignor to Dunning Ltd., East Sanford, N.C.

Filed Apr. 18, 1975, Ser. No. 569,469

Int. Cl.² A47C 17/14

U.S. Cl. 5—13 **4 Claims**



1. A convertible sofa comprising:

a. a sofa frame including a front board and end walls extending rearwardly therefrom;

b. a bed frame mounted within said sofa frame behind said front board and between said end walls and comprising at least an upper and lower spring section hinged together along corresponding longitudinal edges adjacent said front board;

c. said spring section being movable with relation to each other between a folded, sofa position and an open, bed position;

d. said upper and lower spring sections, in said sofa position, being folded closely adjacent each other in flat, overlying relationship behind and beneath the upper edge of the front board;

e. an elevating means connecting said upper and lower spring sections for raising said lower spring section above the upper edge of said front board said elevating means including a lever means supported by said sofa frame pivotally attached to said lower spring section and movable between a lowered position and an upstanding position, and an activating means connecting said lever means with said upper spring section for activating said lever means responsive to unfolding of said upper spring section.

3,965,500

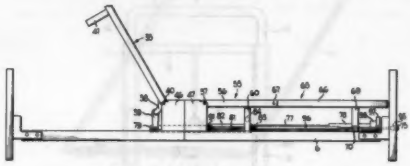
ADJUSTABLE BED WITH AUTOMATIC KNEE BREAK

William H. Stein, Jr., Batesville, Ind., assignor to Hill-Rom Company, Inc., Batesville, Ind.

Filed Mar. 20, 1975, Ser. No. 560,224

Int. Cl.² A47C 3/32

U.S. Cl. 5—68 **12 Claims**



1. In an adjustable bed of the type having a movable head portion, head adjusting means coupled to said head portion for moving said head portion, and a movable knee portion, the improvement comprising knee adjusting means connected to said head adjusting means, having an active configuration and an inactive configuration and movable between said active and inactive configurations for, when in said active configuration, raising said knee portion above the flat position during at least a part of the time said head adjusting means moves said heat portion, said knee adjusting means not moving said knee portion when in said inactive configuration, and shifting means for moving said knee adjusting means between said active and inactive configurations, wherein said knee adjusting means includes a cam and a follower and said cam, when said knee adjusting means is in said active position and moving said knee portion, presses against said follower, said cam being connected to said head adjusting means and said cam follower is connected to said knee portion, said head adjusting means includes an elongated member moving translationally when said head adjusting means moves said head portion, and said cam connects to said elongated member, said cam, when said knee adjusting means occupies said active configuration, has rotational separation from said follower when said knee adjusting means occupies said inactive configuration, and said shifting means rotationally moves said cam, retaining means for holding said knee adjusting means in said active configuration until said shifting means moves said knee adjusting means out of said active configuration when said shifting means moves said knee adjusting means in said active configuration, said head adjusting means includes hand crank means manually rotatable for moving said elongated member translationally, and wherein said cam, when said knee adjusting means is in said inactive configuration, does not touch said cam follower, said knee portion, or said head portion.

3,965,501

BED INTENDED FOR USE BY SICK AND INVALID PERSONS

René Bucher, Stockackerstrasse 17, CH - 4153 Reinach, Switzerland

Filed Mar. 24, 1975, Ser. No. 561,640

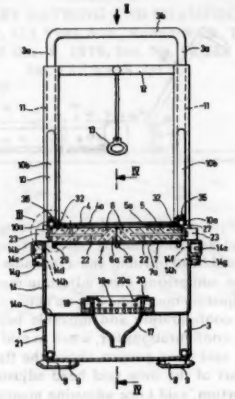
Claims priority, application Switzerland, Apr. 5, 1974, 4776/74

Int. Cl.² A47K 3/12; A61G 7/02

U.S. Cl. 5—90 **8 Claims**

1. A bed intended for use with sick and invalid persons, comprising a bed frame, bed cushion means provided for the bed frame, said bed frame including a vertically adjustable support frame, said bed cushion means comprising a cushion element and an upper portion arranged above the cushion element and supported by the vertically adjustable support frame, displacement means for the cushion element, said displacement means serving to displace the cushion element out of the region of said upper portion and to again bring such below such upper portion, said bed frame being equipped with

a trough provided with a closable discharge, the upper portion of the bed cushion means can be lowered into said trough when the cushion element has been removed out of the region of the upper portion, said cushion element comprises two components extending essentially in the lengthwise direction of the bed, said two components being separated by a substantially vertically extending separation surface, the bed frame having a head end and a foot end, the cushion element-displacement means being provided at both the head end and the foot end with a respective guide member secured to the bed frame and extending in the transverse direction of the bed, and guide elements connected with the cushion element-components displaceably guided in said guide members.



3,965,502

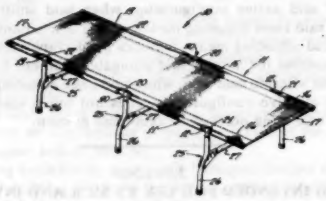
FOLDING COT

Wallace H. Bertram, La Crescenta, Calif., assignor to Goode Products, Inc., Vernon, Calif.

Filed Oct. 15, 1974, Ser. No. 514,716

Int. Cl.² A47C 17/68, 17/70

U.S. Cl. 5—111 **1 Claim**



1. A folding cot comprising:

a pair of side rails, each side rail having at least two sections, the sections of each side rail being interconnected in a manner permitting folding of each side rail at least in half;

a flexible body-supporting sheet connecting said side rails; and

a plurality of support members located beneath said side rails and said body-supporting sheet and being removably connectible thereto for supporting said side rails and said body-supporting sheet in a horizontal plane, each of said support members comprising:

a pair of legs, the upper end of each leg being removably connectible to one of said side rails, the lower end of each leg being adapted to contact a horizontal support surface, each of said legs of each of said support members being laterally offset at a point intermediate the opposite ends thereof, the ends of each leg on opposite sides of said offset portion being parallel, the upper ends of the legs of each support member being spaced by an amount less than the spacing between the lower ends thereof when said legs are connected to said side rails;

a reinforcing bar positioned between said legs; and

a pair of identical hinges connecting the ends of said reinforcing bar to said legs, each of said hinges comprising a bifurcated portion defining a pair of arms, the ends of said arms being pivotably connected to said legs adjacent the lower ends of said offset portions of said legs, said legs being positionable in first positions in which said legs are essentially parallel to each other and perpendicular to said reinforcing bar, said hinges preventing movement of said upper ends of said legs toward each other beyond said first positions, said arms straddling said offset portions of said legs when said legs are in said first positions with said upper ends of said offset portions resting against said ends of said reinforcing bar, thereby stabilizing said legs against both horizontal and vertical rotation relative to said reinforcing bar, said hinges permitting, upon removal of said upper ends of said legs from said side rails, pivotable movement of said legs relative to said reinforcing bar, in opposite directions, through angles of approximately 90°, said lower ends of said legs moving toward each other to second positions in which said legs and said reinforcing bar are essentially parallel, the overall length of said support member with said legs in said second positions being approximately equal to the length of each section of said side rails.

3,965,503

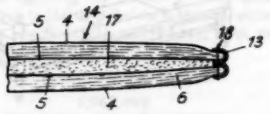
METHOD OF PRODUCING AN ABSORBENT, WASHABLE, PROTECTIVE MATTRESS SHEET AND A SHEET PRODUCED THEREBY

Joseph Y. Gridel, 59-Saint Souplet, France

Filed Nov. 7, 1974, Ser. No. 521,827

Int. Cl.² B32B 7/08

U.S. Cl. 5—334 R **29 Claims**



1. A method of producing a protective sheet comprising two outer layers protecting an inner layer of fibers, the outer layers being joined by stitching, one of the faces of the protective sheet being waterproofed after the sheet has been stitched together, this method being characterized in that the inner layer comprises a felt made of waterproof synthetic fibers or superposed layers of waterproof synthetic fibers oriented essentially in the same direction and in that this inner layer is loosely joined by a bonding agent thus producing bonds directed essentially perpendicularly to said outer layers such that the sheet remains distended, in that the outer layers are placed on each of the faces of the inner layer, one of the outer layers comprising a mesh the spacing of which is at least 0.4 mm, in that the joining stitches are spaced apart by at least 2 cm, and in that one of the faces of the other one of the outer layers is waterproofed by a process during which the temperature is kept lower than the polymerization temperature or softening temperature of the bonding agent.

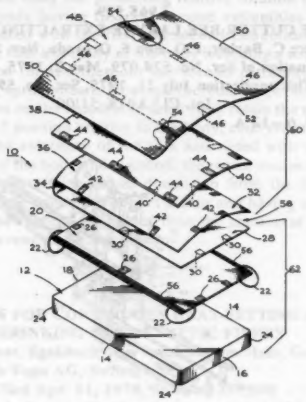
9. A protective sheet produced according to the method claimed in claim **1**, characterized in that the inner layer has a high retention capacity for water, the lower waterproofed layer and the upper layer consisting of waterproof protective sheets having a loose weft to facilitate the passage of liquids from the upper layer into the inner layer.

3,965,504

BEDDING ASSEMBLY

Phillis Ainsworth, 18500 Mayall St., Apt. D, Northridge, Calif. 91324

Filed May 1, 1975, Ser. No. 573,479
Int. Cl.² A47G 9/00
U.S. Cl. 5—334 C 10 Claims



1. An improved bedding assembly, comprising, in combination,

a mattress,

sheeting means having top and bottom portions,

heat insulating means,

means releasably interconnecting said top and bottom portions and heat insulating means in a stacked, non-slip relation along interconnection lines adjacent two opposite long sides thereof,

said top and bottom portions of said sheeting means being connected at the foot end thereof but not the head end thereof,

wherein the width of said bottom portion of said sheeting means between said interconnection lines is substantially the same width as the width of said mattress, and

wherein the width of said upper portion of said sheeting means and said insulating means between said interconnection lines is substantially greater than the width of said lower portion of said sheeting means,

whereby a body-receiving open sleeping pocket is formed between the top and bottom portions of said sheeting means.

3,965,505

SLEEPING BAGS

Sydney William Thorowgood, Auckland, New Zealand, assignor to General Sports Manufacturing Limited, Auckland, New Zealand

Filed Dec. 17, 1974, Ser. No. 533,685
Int. Cl.² A47G 9/00
U.S. Cl. 5—343 4 Claims

1. A sleeping bag comprising:

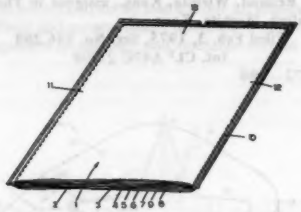
a first bottom panel;

a second top panel overlying said first panel;

said first and second panels being permanently joined at adjacent side and foot edges thereof, adjacent head edges of said first and second panels being unjoined to form an entrance to a double sleeping compartment between said first and second panels;

said first and second panels being foldable in half such that first of said permanently joined side edges are adjacent second of said permanently joined side edges, and such that said second top panel is folded to form a double-layer inner member and said first bottom panel is folded over said inner member to form an outer member; and

connecting means, attached to at least said first and second permanently joined side edges, for selectively connecting



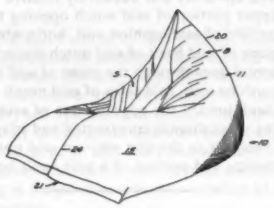
said first and second permanently joined side edges when said panels are folded and for thereby forming a single sleeping compartment between the layers of said inner member.

3,965,506

FURNITURE CONSTRUCTION

Robert J. Marks, 210 Johnson Ferry Road, Atlanta, Ga. 30328

Filed Mar. 4, 1975, Ser. No. 555,168
Int. Cl.² A47C 23/00, 27/00
U.S. Cl. 5—345 R 4 Claims



1. An article of furniture adapted to be supported on a supporting surface comprising:

a cover including an elongate rectilinear piece of flexible material having strength only in tension folded back over itself midway its length so that the opposed ends of the material overlie each other to form an overlapped end where the opposed ends of the material overlie each other and a folded end opposite the overlapped end where the material is folded, the opposed overlying side edges of the material attached together along their lengths to form opposed, generally parallel side seams and the overlying ends of the material attached together at the overlapped end so that the opposed side seams overlie each other at the overlapped end to form a cushion chamber therein; and,

a resilient cushion material having sufficient structural integrity to maintain the general shape of the article of furniture when a weight is imposed thereon corresponding to the general shape of the article of furniture when the weight is removed therefrom, filling said cushion chamber so that when the article of furniture is placed on the supporting surface so that the overlapped end is generally parallel to the supporting surface and the folded end is generally normal to the supporting surface and, alternatively, if the overlapped end is generally normal to the supporting surface and the folded end is generally parallel to the supporting surface, a seat with a back rest is formed, said cushion material including a first prescribed portion of ground flakes of expanded plastic

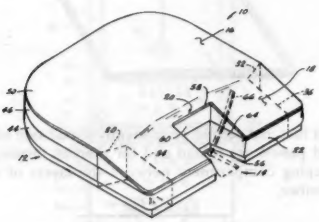
material and a second prescribed portion of shredded foam rubber mixed together.

3,965,507

ATHLETE'S LANDING PIT CUSHION

Harold P. Reiland, Wichita, Kans., assignor to The Langdon Corporation, Wichita, Kans.

Filed Feb. 3, 1975, Ser. No. 546,268
Int. Cl.² A47C *27/08*
U.S. Cl. 272—104 **5 Claims**



1. An athlete's landing pit cushion, comprising:
   a. a cushion unit having a relatively smooth top portion, a portion of said top portion inclined downwardly; and
   b. an essentially rectangular upright notch in an edge portion of a side of said cushion unit, said notch portion having opposed sides and a back, said sides and said back inclined upwardly and outwardly relative to the vertical, the upper portion of said notch opening to said inclined top portion of said cushion unit, horizontal lines through the plane of said back of said notch essentially parallel to horizontal lines through the plane of said edge portion of said cushion unit, said sides of said notch divergent from said back toward the edge portion of said cushion unit;

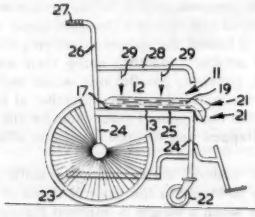
said landing pit cushion is constructed and adapted to be used in a pole vault pit or the like wherein said notch is placed at the pole resting end portion of a pole vault box or the like.

3,965,508

SEATING CUSHION

Ronald Bruce Hunter, 47 Cedar St. South, Timmins, Ontario, Canada (P4N 2G5)

Filed Apr. 14, 1975, Ser. No. 567,871
Claims priority, application Canada, Jan. 24, 1975, 218623
Int. Cl.² A47C *27/08*
U.S. Cl. 5—368 WB **5 Claims**



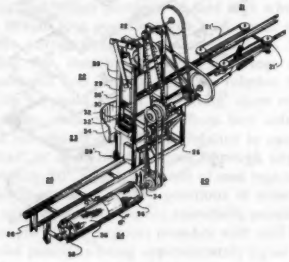
1. A cushion for use as a seating cushion for invalids on wheel chairs or the like, made from a flexible, fluid impervious sheet material, comprising:
   an airtight hollow seat portion;
   a hollow tongue portion in conduit communication with the said hollow seat portion and extending therefrom beyond the proposed seating area into the space intended for the invalid's legs and
   a closeable orifice in communication with the said hollow tongue and seat portions, whereby when the said cushion with said hollows filled with a fluid at ambient pressure is laid upon the seat of a chair leaving said tongue portion to depend downwardly in a seat unoccupied state, a person's weight subsequently occupying said cushion expresses an amount of fluid into said tongue portion to lift it into a horizontal position to assist in separation of the legs of the invalid.

3,965,509

LEAF CUTTER BEE LARVAE EXTRACTING DEVICE

Theodore C. Barber, P.O. Box 5, Orovada, Nev. 89425

Continuation of Ser. No. 574,079, May 2, 1975, abandoned.
This application July 21, 1975, Ser. No. 597,721
Int. Cl.² A01K *51/00*
U.S. Cl. 6—12 A **9 Claims**



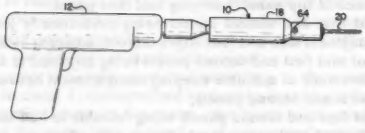
1. An apparatus for cleaning bee culture frames of the type having slots for frames, which are formed into blocks by aligning said frames, comprising:
   a suitable framework;
   an in-feed ramp carrying said blocks to a vertically disposed channel provided on said framework, said channel providing means for controlling forward movement of said block on said ramp and providing means for conducting frames separated from said block downwardly;
   a board-breaker assembly comprising a blade reciprocating vertically in a channel disposed parallelly to said frames with the contact face of said blade being disposed at a pre-determined position to operate at the upper edge of the forwardmost frame in said block; and
   a board-cleaning assembly disposed distally below said board-breaker assembly along said vertical channel, said cleaning assembly having means for removing larvae and the like from said frames, and a reassembly and off-feed assembly including an off-feed conveyor disposed below said cleaning assembly at the lowermost portion of said channels, said channels being provided with means rectilinearly aligning said frames into said block.

3,965,510

COMBINATION DRILLING AND WRENCHING TOOL

Richard John Ernst, Palatine, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 575,922, May 9, 1975, abandoned. This application Sept. 15, 1975, Ser. No. 613,136
Int. Cl.² B25F *3/00*
U.S. Cl. 20—7 **20 Claims**



1. A tool for drilling a hole in a workpiece and setting a screw-type fastener therein, including a rotatable mandrel

with a first extremity including means to removably secure a drill bit in coaxial arrangement therewith and a second extremity having torque transmitting surfaces formed thereon, a generally cylindrical body having a through bore, the body thereby telescopically and axially slidably mounted on the mandrel, a sleeve member mounted on the body for rotation relative thereto, stop means interacting between the sleeve and the body preventing free axial movement of the sleeve relative to the body but permitting relative rotation therebetween, the body having first and second extremities respectively associated with the first and second extremities of the mandrel, the first extremity of the body including a wrenching socket means formed thereon, the second extremity of the body having spring means mounted thereon cooperating with groove means on the mandrel to selectively retain the mandrel in a retracted position relative to the body, axial recess means formed at the extremity of the tool associated with the first extremities of the body and mandrel, the recess means extending for a predetermined axial dimension from the terminal extremity of the wrenching socket means and having an internal transverse dimension greater than the transverse dimension of the wrenching socket means.

3,965,511

PROCESS FOR CONTINUOUS HEAT-SETTING AND SHRINKING OF SYNTHETIC FIBERS

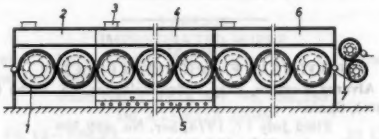
Heinz Fleissner, Egelsbach near Frankfurt am Main, Germany, assignor to Vepa AG, Switzerland

Filed Apr. 11, 1973, Ser. No. 350,090

Claims priority, application Germany, Apr. 14, 1972, 2218035

Int. Cl.² D06B *3/04, 3/02, 21/00*

U.S. Cl. 8—149.1 **14 Claims**



1. A process for continuous heat-setting and shrinking of synthetic fibers in the form of yarns with a twist and synthetic fibers in the form of tows with a forced crimp by a heated fluid medium, characterized in that the synthetic fibers in at least one of said forms, in a two-step continuous procedure, are treated initially in a heated fluid medium selected from the group consisting of hot water at temperatures just below 100°C., saturated steam, and slightly superheated steam, and the synthetic fibers are immediately thereafter treated in a second heated fluid medium selected from the group consisting of air, superheated steam, and a superheated steam-air mixture at high temperature conditions between 150°C. and 250°C.

3,965,512

PRECISE NAVIGATION BUOY

Derek J. Bennett, Thousand Oaks, and Leslie G. Bullen, Westlake Village, both of Calif., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Feb. 10, 1975, Ser. No. 548,552

Int. Cl.² B63B *21/52*

U.S. Cl. 9—8 R **15 Claims**

1. For use in resiliently mooring a buoy deployed on a water surface with said buoy subject to ambient forces and having a cable extending between said buoy and an anchor as said anchor descends toward the water floor, the improvement comprising:

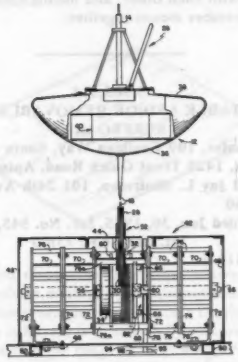
a drum with a portion of said cable wound on said drum,

first means rotatably supporting said drum to enable said cable to unwind from drum in response to the descent of said anchor toward said floor,

tensed resilient means having a force stored therein,

second means operable for applying the force stored in said resilient means to said cable in opposition to said ambient forces,

and third means carried by said anchor for engagement with said floor and automatically operated in response to said engagement to operate said operable second means for



applying the force stored in said resilient means to said cable in opposition to ambient forces on said buoy, and

in which said means rotatably supporting said drum include a shaft in said anchor rotatably supporting said drum in said anchor, and said resilient means comprises a power spring spirally wound about said shaft and having an inner radial end secured to said shaft and an outer radial end secured against movement relative said anchor whereby said spring is tensed in response to rotation of said shaft in one direction.

3,965,513

SECTIONAL BOAT STRUCTURES

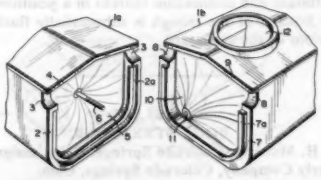
Kotaro Horiuchi, Hamamatsu, Japan, assignor to Yamaha, Hatsudoki Kabushiki Kaisha, Japan

Filed Feb. 7, 1975, Ser. No. 547,929

Claims priority, application Japan, Feb. 9, 1974, 49-16665

Int. Cl.² B63B *7/04*

U.S. Cl. 9—25 **13 Claims**



1. A boat structure having longitudinally extending body means which includes a first body section having a first mating end portion at its rear end, a second body section having a second mating end portion at its front end, said first and second body section having at the respective mating end portions abutting peripheral edge means which are in abutting engagement with each other when the body means is assembled, said abutting peripheral edge means on the first and

second body sections having mutually engagable groove means and projection means, first connecting member means in the first body section and extending substantially radially inwardly from the peripheral edge means thereof, second connecting member means in the second body section and extending substantially radially inwardly from the peripheral edge means thereof, said first and second connecting member means being axially offset from the abutting peripheral edge means in the first and second mating end portions, respectively, so that the first and second connecting member means are spaced from each other when the abutting edge means of the first and second mating end portions are put into abutting engagement with each other, and means for connecting said connecting member means together.

3,965,514

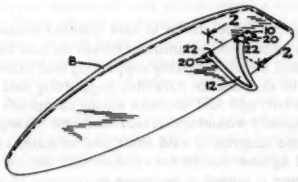
ADJUSTABLE AND/OR REMOVABLE FIN FOR SURFBOARDS

Arthur B. Shafer, 109 Coalinga Way, Santa Cruz; James E. Richardson, 1425 Trout Gulch Road, Aptos, both of Calif. 95003, and Jay L. Shuirman, 101 24th Ave., Santa Cruz, Calif. 95060

Filed Jan. 30, 1975, Ser. No. 545,762

Int. Cl.² A63C *15/00*

U.S. Cl. 9—310 E **5 Claims**



1. A removable fin unit for a surfboard which comprises a fin having integral fillets at opposite sides of its base and arranged to abut the bottom of the surfboard, and

means for removably joining said fillets to said surfboard, said joining means including a fin holder having the conformation of an open-ended rectangular trough, the sides of which are adapted for insertion into the bottom of surfboard and connection thereto in a position such that the bottom of the trough is substantially flush with the bottom of the surfboard.

3,965,515

BOOT STRETCHER

George H. Moberly, Colorado Springs, Colo., assignor to The Moberly Company, Colorado Springs, Colo.

Filed Dec. 30, 1974, Ser. No. 537,362

Int. Cl.² A43D *5/00*

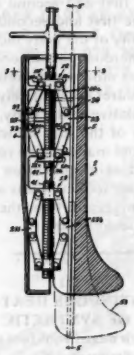
U.S. Cl. 12—114.6 **6 Claims**

1. Apparatus for selectively stretching portions of a foot boot comprising:

a body generally conforming in its shape to the space within a boot, including a shortened foot portion, said body comprising anterior and posterior halves;

upper and lower expandable connecting means interconnecting the said body halves; and

means selectively engageable with the said upper and lower



connecting means to expand the said connecting means and spread apart the said body halves.

3,965,516

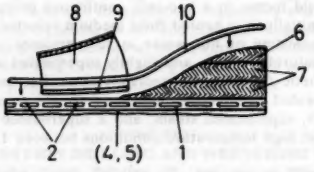
FOOTWEAR FABRICATION PROCESS

Juan Alvarez Romero, Fray Pedro Balaguer, 25, Elche (Alicante), Spain

Filed July 17, 1974, Ser. No. 489,396

Int. Cl.² A43D *9/00*; A43B *7/06*

U.S. Cl. 12—142 V **3 Claims**



1. A process for fabrication of ventilated footwear of varying sizes comprising the steps of:

a. forming a spiral edged sole of predefined configuration and of cross-stitched dimension cord-like thread;

b. placing said sole in a rubber containing mold of predefined configuration and dimension corresponding to those of said sole;

c. setting said sole to achieve vulcanization of at least a portion thereof;

d. forming a heel having at least an outermost side portion of cross-stiched cord-like thread, and;

e. joining adhesively said sole and said heel.

3,965,517

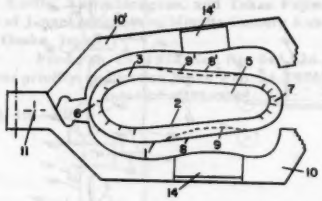
METHOD AND DEVICE FOR THE MANUFACTURE OF FOOTWEAR

Horace Ray Auberry, and Anton Liebscher, both of Waynesville, N.C., assignors to Ro-Search, Inc., Waynesville, N.C.

Continuation-in-part of Ser. No. 410,393, Oct. 29, 1973, abandoned. This application Oct. 18, 1974, Ser. No. 515,901

Int. Cl.² A43D 9/00

U.S. Cl. 12—142 RS 9 Claims



1. The method of manufacture of footwear which includes the steps, in sequence, of placing a prewelted upper upon a last, stringlasting said upper on the last, positioning a lip plate without a side frame in proper relation to the upper, welt and last to position and support the welt into a flat and final position for the finished footwear, locking said lip plate in said position, said last, upper and lip plate constituting a movable unit, and thereafter moving the unit in molding relation to a sole cavity member having a side frame forming the side walls thereof and placing an elastomeric material in the cavity and molding a sole to the welt.

3,965,518

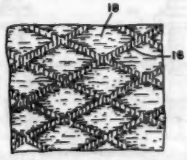
IMPREGNATED WIPER

Erland L. Muoio, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed July 8, 1974, Ser. No. 486,285

Int. Cl.² B32B 29/06

U.S. Cl. 15—104.93 21 Claims



1. A disposable self-polishing wiper for polishing of household surfaces with an emulsion polish, depositing a glossy protective film thereon, comprising:

a cellulosic fibrous web substrate having a basis weight of at least about 40 g./m.², said substrate having a bonding material penetrated into at least one surface thereof in a fine pattern to form bonded web portions of greater strength than adjacent portions not containing said bonding material, said substrate being substantially compressible, said substrate having a liquid capacity of at least about 200% by weight of substrate; and

a surface treating liquid composition impregnated in said substrate in a weight ratio range to said substrate of about 1:1 – 3:1, said composition being a substantially wax-free oil-in-water emulsion comprising water and an internal phase consisting essentially of about 4 – 65% by weight of a mineral oil having a viscosity of about 50–250 SSU, silicone fluid in a weight ratio to said mineral oil of about 1:12 – 2.5:1 and having a viscosity of about 50 – 5,000 centistokes, said emulsion having an internal phase of about 4 – 70% by weight of said composition, said substrate being loaded to no more than about 50% of liquid capacity.

3,965,519

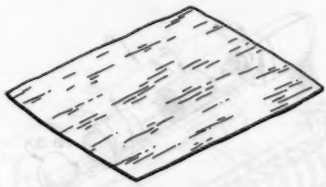
DISPOSABLE FLOOR POLISHING WIPE

James F. Hermann, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed July 8, 1974, Ser. No. 486,323

Int. Cl.² A47L 13/17; B65D 85/70

U.S. Cl. 15—104.93 15 Claims



1. A packaged disposable floor wipe adapted to apply a substantially uniform coating of an aqueous coating composition to a floor comprising in combination a flexible non-woven substrate which substrate is substantially compressible having a basis weight within the range of from 40 g/m² to 190 g/m², has a bonding material penetrated into at least 1 surface of said substrate in a fine pattern to form bonded web portions of greater strength than adjacent portions non containing said bonding material, said pattern comprising less than 35% of the total surface area of the web to give said substrate substantial wet strength, and having a liquid capacity sufficient to absorb from 4 to 10 times the weight of said substrate of water and an aqueous floor coating composition selected from emulsion coatings, alkali-soluble coatings and solution coatings, said coating composition having from 5 to 25% non-volatiles, a pH of from 7.0 to 10.0 and including from 5 to 18% by weight of a film-forming polymeric coating agent said coating composition impregnated in said non-woven substrate at a loading of from 3.0:1 to 6.5:1.

3,965,520

BRUSH AND CLEANING COMPOSITION FOR PHONOGRAPH RECORDS

Bruce R. Maier, 2802 Terry Lane, Columbia, Mo. 65201

Division of Ser. No. 260,828, June 8, 1972, abandoned. This application Oct. 15, 1974, Ser. No. 514,430

Int. Cl.² A46B 9/02, 11/00; C11D 3/48

U.S. Cl. 15—104.94 3 Claims

1. In combination with a cleaning composition comprising a mixture of a surfactant, an emulsifier, an anti-microbe consisting of a fungicide, and a liquid carrier, said composition being used in the cleansing of a phonograph record, a brush comprising a frame member which facilitates grasping by the hand, a cloth means mounted to said frame member, a cushioning means disposed between the exposed surface of said cloth means and the frame member, and the pile of said cloth

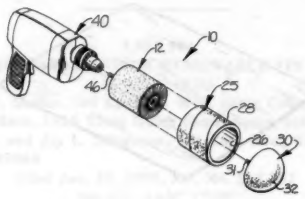
being angularly oriented with respect to the surface of the cloth from which it projects to facilitate the loosening and retention of particles from the record grooves during the cleaning of the phonograph record through the use of said cleaning composition.

3,965,521

CONVERTIBLE MULTI-PURPOSE BRUSH ASSEMBLY

Winnifred A. Wardell, 1312 Biltmore Drive, Charlotte, N.C. 28207

Filed Sept. 19, 1974, Ser. No. 507,274
Int. Cl.² A46B *13/02, 15/00;* **B05C** *17/02;* **B24D** *9/00*
U.S. Cl. 15—114 **13 Claims**



1. A convertible multi-purpose brush assembly characterized by providing a multiplicity of working surfaces for a variety of tasks and versatility and ease in conversion for various uses; said brush assembly comprising:

a generally cylindrical, flexible, resilient brush member having a predetermined outside diameter and providing an outside working surface of a predetermined character for performing certain tasks and having at least one substantially unobstructed end;

a desired plurality of sleeve members each defining a hollow, generally cylindrical interior having a predetermined inside diameter less than the outside diameter of said brush member and each providing an outside working surface of a different predetermined character than said working surface of said brush member and different from each other for performing certain different tasks;

said sleeve members being selectively and removably force-fitted one at a time on and around said brush member from said substantially unobstructed end thereof due to the resilience and flexibility thereof and the difference in the diameters to prevent relative displacement between said members during use of said brush assembly and for providing said brush assembly selectively with said outside working surfaces of said sleeve members, while allowing easy replacement of said sleeve members and removal of said sleeve members from said brush member for converting said brush member and selectively providing said brush member with said outside working surfaces of said sleeve members and said brush member; and

a desired number of end cap members selectively and removably secured to the outer longitudinal end portion of said brush member and each having an outside working surface of a predetermined character for performing certain tasks and for providing additional versatility to said brush member.

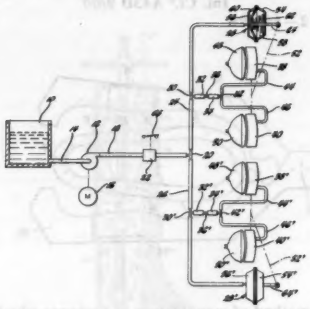
3,965,522

HEADLAMP WASHER SYSTEM

John S. Pavey, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed June 23, 1975, Ser. No. 589,352
Int. Cl.² B60S *1/46*
U.S. Cl. 15—250.04 **2 Claims**

1. In a headlamp cleaning system comprising; wiper means adapted for movement across the surface of the headlamp; nozzle means disposed on said wiper means for dispensing liquid on the surface of the headlamp; actuator means connected with said wiper means for controlling movement of said wiper means; the improvement comprising; pump means for supplying liquid at superatmospheric pressure; and passage means for communicating liquid from said pump means to said actuator means and said nozzle means, and including restriction means downstream of said actuator means and



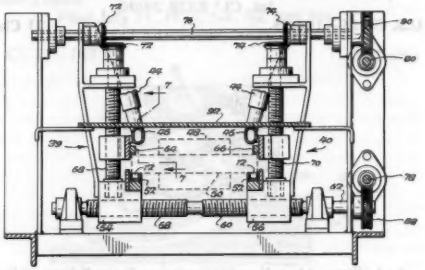
upstream of said nozzle means for maintaining the pressure of the liquid at a sufficient superatmospheric pressure level to actuate said actuator means and for controlling the flow of liquid through said nozzle means whereby a single source of liquid provides power to operate said actuator and supplies cleaning liquid for the system.

3,965,523

BEARING WASHER

Jack P. Elliott, Amherst, N.Y., assignor to J. P. Elliott Associates, Inc., Buffalo, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,311
Int. Cl.² A47L *5/38*
U.S. Cl. 15—302 **13 Claims**



1. A bearing washing machine for washing and cleaning bearings, each such bearing having an inner and outer race with a plurality of roller means disposed therebetween, and wherein the bearings can be continuously fed into said washing machine and processed thereby, said bearing washing machine comprising:

a housing;

conveyor means for conveying bearings through said housing, said conveyor means having two spaced, substantially parallel bearing support means for supportably conveying diametrically opposite portions of each said outer race means so that each respective inner race means is rotatable during conveyance of each bearing through said housing;

conveyor drive means, said drive means being in driving connection with said conveyor means for driving said conveyor means through said housing, and;

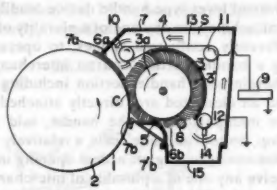
a plurality of fluid nozzles being disposed adjacent to said bearing support means, said fluid nozzles being so disposed for directing a corresponding plurality of fluid flows onto said bearings upon conveyance of said bearings past said nozzles.

3,965,524

RESIDUAL TONER REMOVING APPARATUS

Takaji Kurita, Kawachinagano, and Takao Fujiwara, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 19, 1974, Ser. No. 443,524
Claims priority, application Japan, Feb. 24, 1973, 48-22398
Int. Cl.[2] A47L *5/38*
U.S. Cl. 15—308 20 Claims



1. A residual toner removing apparatus for removing residual toner particles from a photoreceptor surface, said apparatus comprising:

a rotatable cleaning brush mounted for contact with a photoreceptor surface;

a casing surrounding a portion of the periphery of said brush;

a housing enclosing said casing and having associated therewith a restriction board compressing said brush at a position along the circumference thereof upstream from the position whereat said brush contacts a photoreceptor surface;

said restriction board and a first circumferential end of said casing forming therebetween an air outlet leading from within said casing to a chamber between said casing and said housing;

said housing and a second circumferential end of said casing forming therebetween an air inlet leading from said chamber into said casing;

whereby, upon rotation of said brush, toner particles are removed from a photoreceptor surface and carried thereby past said inlet and through said casing to said outlet through which said removed toner particles are expelled into said chamber, and a continuous circulation of air is created from said chamber through said inlet, through said casing with said removed toner particles to said outlet through which said air is expelled with said removed toner particles into said chamber, and back through said inlet; and

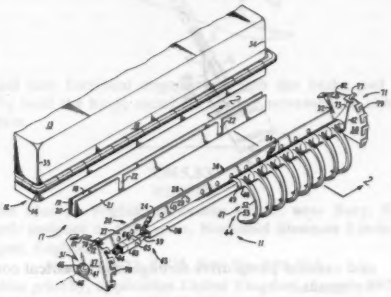
a surface positioned about a portion of the periphery of said brush, said surface being charged to a polarity opposite that of said toner particles, said surface comprising means for electrically attracting said removed toner particles from said air within said chamber.

3,965,525

SHAG RAKE ATTACHMENT FOR UPRIGHT VACUUM CLEANER

Edward C. Brissette, 790 Woodside Lane, Apartment 12, Sacramento, Calif. 95825, and Edwin W. Smith, Jr., 2700 Saddletree Lane, Rocklin, Calif. 95677

Filed May 9, 1975, Ser. No. 575,992
Int. Cl.[2] A47L *9/06*
U.S. Cl. 15—373 11 Claims



1. A shag rake attachment for upright vacuum cleaner having a nozzle oriented transversely to the path of vacuum cleaner travel, said attachment comprising:

a. a transverse frame including means for adjusting said frame to be substantially coextensive in length with said nozzle;

b. means for mounting said frame on said nozzle; and

c. a transversely elongated rake mounted on said frame, said rake being substantially coextensive in length with said frame and parallel thereto, said rake including a plurality of teeth capable of engaging the shag as the vacuum cleaner is moved along the path of travel.

3,965,526

SUCTION HOSE WITH CONDUCTOR MEANS FOR ELECTRICAL CURRENT

Eric G. Doubleday, Am Kraherwald 167, 7 Stuttgart W, Germany

Filed Nov. 12, 1973, Ser. No. 414,834
Claims priority, application Germany, Nov. 16, 1972, 2256231
Int. Cl.[2] A47L *5/00*
U.S. Cl. 15—377 17 Claims

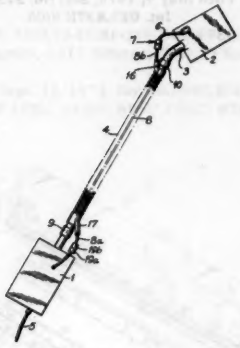
1. A suction hose for a cleaning apparatus provided with an electrically driven vacuum pump and a separate suction head with electrically actuated cleaning brush means, comprising:

a substantially air-tight flexible external tube;

a flexible inner tube, substantially coaxial with said external tube and spaced therefrom;

electrical conductor means interposed between said external and said inner tubes and aligned substantially with the axes of said tubes; and

connector means for interconnecting the actuator for said cleaning brush means with the electrical power supply for



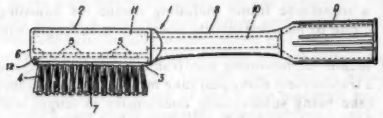
said vacuum pump drive through said electrical conductor means.

3,965,527

VACUUM GROOMING BRUSH

Ivor Prosser George, West Winds, Cilfrew, Neath, Glamorganshire, Wales

Filed Sept. 10, 1974, Ser. No. 504,797
Int. Cl.² A47L 9/06
U.S. Cl. 15—396 3 Claims



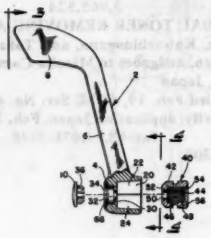
1. A vacuum grooming brush comprising a brush head having walls defining an enclosed vacuum chamber, a hollow handle integral with the brush head communicating at one end with the vacuum chamber and at the other end being adapted for connection to a domestic vacuum cleaner, a set of bristles extending from one wall of the brush head, said bristles being arranged in rows extending substantially parallel to the longitudinal axis of the brush head and the handle, vacuum inlet passages formed in said one wall of the brush head located only in the marginal edge regions of said one wall between the bristles and the other edges of the head on two opposite longitudinally-extending sides thereof, said passages communicating with the interior of the vacuum chamber, and flow equalization means located within the vacuum chamber adapted to equalize the flow of air through said vacuum inlet passages over their longitudinal extension, said flow equalization means comprising a wedge -shaped relief portion formed in the upper wall of the brush opposite to said one wall, and extending into the vacuum chamber, the longitudinal axis of said wedge-shaped relief portion being co-axial with the longitudinal axis of the brush and the apex of said relief portion being directed towards the outlet from the vacuum chamber formed by the interior of said hollow handle.

3,965,528

UNIVERSAL ELBOW ACTION LEVER HANDLE

Gerald Kissler, Woodcliff Lake, N.J., assignor to Kissler & Co., Inc., Englewood, N.J.

Filed Oct. 1, 1974, Ser. No. 511,314
Int. Cl.² A47B 95/02
U.S. Cl. 16—110 R 10 Claims



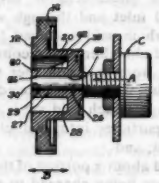
1. A universal lever type handle device readily convertible for secure attachment to any one of a plurality of valve stems, having differently configured splines, to operate the same, comprising a handle portion and an interchangeable insert member therein; said handle portion including a solid base portion and an elongated arm directly attached to said base portion for manipulation of the handle, said base portion including top, bottom and side walls, a relatively large interior standard size cavity having an access opening in said bottom wall to receive any one of a plurality of interchangeable insert members, a roof defining wall in said cavity proximate said top wall of said base portion, and a screw hole through said top and roof defining walls; each of said interchangeable insert members having an exterior configuration corresponding to the configuration of said cavity so as to fit securely in said cavity, and each of said interchangeable insert members having an interior broach respectively configured for secure mating attachment to a correspondingly configured spline of a respective valve stem, each of said interchangeable insert members having a screw hole through a top wall thereof for positioning in direct alignment with said screw hole in said handle portion; whereby such an insert member fits firmly in said cavity to adapt the lever type handle for attachment to a respective valve stem spline and the handle may be secured by a screw through said screw holes to such a valve stem spline, and by interchanging insert members one for another the lever type handle may be readily adapted for attachment to different corresponding valve stem splines.

3,965,529

MOLDED CONTROL KNOB

Theodore M. Hadzimahalis, Libertyville, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 9, 1975, Ser. No. 539,834
Int. Cl.² F16D 1/06
U.S. Cl. 16—121 11 Claims



1. A unitarily molded control knob for mounting a D-shaft of an electrical control or the like, comprising:

a front face plate and a peripheral manual gripping portion;

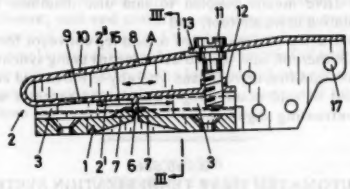
a hollow cylindrical hub portion including a rear wall extending rearwardly of said face plate to define a body portion; and

an integrally molded D-shaft receiving means within said body, including a generally flat floor portion for engaging the flat of the D-shaft, side guide means for encapsulatingly engaging side portions of the D-shaft, said floor and guide means being supported within the body portion by a plurality of radially directed, longitudinally extending support flanges, and a flexibly resilient cantilever arm projecting from said rear wall and independent of said floor and guide means and spaced from and opposite said flat floor portion for engaging the D-shaft opposite its flat to bias the D-shaft against said floor portion and frictionally maintain the D-shaft longitudinally within the receiving means.

3,965,530
HINGE DEVICE

Erich Röck, Hochst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Blum Gesellschaft m.b.H., Hochst, Austria

Filed Mar. 26, 1975, Ser. No. 562,153
Claims priority, application Austria, Mar. 29, 1974, 2635/74
Int. Cl.² E05D 7/04
U.S. Cl. 16—130 **7 Claims**



1. In a hinge device, especially for furniture doors, of the type including at least one mounting plate that can be fixed to one part of a piece of furniture, and a hinge arm anchored directly or indirectly to said mounting plate and which bears swivel arm means for connection to another part of the piece of furniture, the improvement wherein:

said mounting plate is provided on opposite lateral sides thereof with inwardly directed guides; and

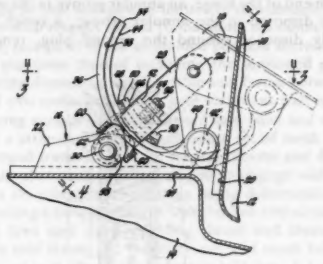
said hinge arm is provided on opposite lateral sides thereof with outwardly directed projection means for insertion into respective of said guides.

3,965,531
INFINITE POSITION DOOR HOLD OPEN

Robert M. Fox, Warren, and Gary A. Wize, Washington, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 12, 1975, Ser. No. 631,053
Int. Cl.² E05D 11/08
U.S. Cl. 16—140 **3 Claims**

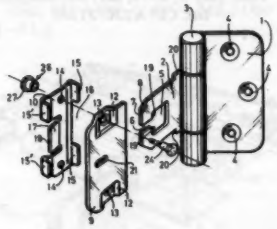
1. An infinite position door hold open comprising, in combination, a pair of pivotally interconnected hinge members movable in door opening and closing directions relative to each other, a brake pad mounted on one hinge member for movement therewith, a brake member mounted on the other hinge member for movement therewith and movement relative thereto into and out of frictional engagement with the brake pad to selectively and alternately hold the hinge members against movement or permit movement in either direction, a brake member actuator mounted on said other member, and cooperating frictionally engageable means on the brake member and brake member actuator operable upon reversal of the direction of movement of the hinge members for moving the brake member relative to the one hinge member and into frictional engagement with the brake pad to thereby hold the hinge members against movement in either direction.



3,965,532
HINGES

Douglas Mervyn Wigfall, Holcombe Brook, near Bury, England, assignor to Crompton, Nettlefold Stenman Limited, Wigan, England

Filed July 23, 1975, Ser. No. 598,364
Claims priority, application United Kingdom, Aug. 1, 1974, 33935/74; Jan. 20, 1975, 2463/75
Int. Cl.² E05D 7/12
U.S. Cl. 16—149 **12 Claims**



1. A hinge for pivotally connecting two components, said hinge comprising two pivotally inter-connected leaves and a casing, one leaf being arranged to be secured to one component, the casing being arranged to be secured to the other component and to provide a socket having opposed walls between which the other leaf can slide, one of the walls and said other leaf having complementary formations which interengage with a snap action to hold said other leaf in the socket when said leaf has entered the socket to a predetermined extent, said one wall being arranged to lie between said other leaf and the other component when the hinge is in use.

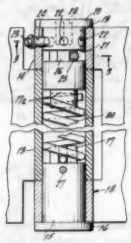
3,965,533
ADJUSTABLE DOOR SPRING HINGE WITH FIXED MINIMUM TENSION

Peter E. Frohlich, Landrum, S.C., assignor to Bommer Spring Hinge Co. Inc., Landrum, S.C.

Filed May 23, 1975, Ser. No. 580,187
Int. Cl.² E05F 1/12
U.S. Cl. 16—189 **6 Claims**

1. A spring hinge comprising opposed hinge leaves, a cylindrical barrel open at each end formed of integral hollow knuckles on said hinge leaves, a first plug secured within one end of the cylindrical barrel and secured to the hollow

knuckle of one of the hinge leaves adjacent thereto, a second plug adjustably secured within the hollow knuckle of the other hinge leaf, said plugs bridging the knuckles of the hinge leaves at each end of the hinge, an annular groove in the second plug, a stop disposed in the annular groove, a series of recesses radially disposed around the second plug, removable pin



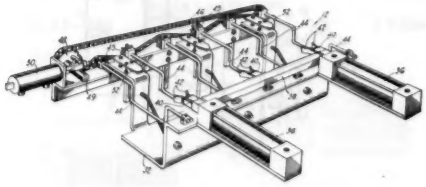
means carried within an opening in the knuckle adjacent the second plug and selectively receivable within the plug recesses, a spring carried between the first and second plugs within the barrel and coupled to said plugs and a fixed pin carried by the hollow knuckle adjacent the second plug, extending into the annular groove and disposed in the path of the groove stop.

3,965,534

POULTRY NECK BREAKING MACHINE

Grover S. Harben, Jr., Gainesville, Ga., assignor to Gainesville Machine Company, Inc., Gainesville, Ga.

Filed July 9, 1974, Ser. No. 486,832
Int. Cl.² A22C *21/00*
U.S. Cl. 17—11 **11 Claims**



1. A machine for breaking the necks of fowls being conveyed along a conveyor line is inverted positions for processing, said machine comprising a frame; a carriage mounted to said frame for movement along an orbital path having an upper arcuate portion; at least one neck breaking blade supported on said carriage; and means for reciprocally driving said blade laterally said orbital path while said carriage is moving along said upper arcuate portion of said orbital path.

3,965,535

POULTRY LEG BONING MACHINE

John J. Kaplan, Council Bluffs, Iowa; Wilhelm H. Richert, Bellingham, Mass., and John W. Trumblee, Council Bluffs, Iowa, assignors to Jo-Bi Farms, Inc., Council Bluffs, Iowa

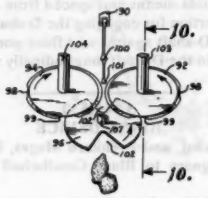
Filed Oct. 17, 1974, Ser. No. 515,669
Int. Cl.² A22B *17/04*
U.S. Cl. 17—1 G **12 Claims**

1. Apparatus for removing meat from a cooked poultry leg having at least one enlarged joint, said apparatus comprising:

a supporting frame;

at least two rotary disc members being substantially circular to provide peripheral stripping edges for engagement with said leg to strip meat therefrom, said disc members being horizontally disposed in juxtaposition and in spaced apart position whereby said leg may be received between the adjacent stripping edges of said disc members, and each of said disc members including at least one peripheral recess in the stripping edge thereof such that when said disc members are rotatably positioned with said recesses in opposed confronting alignment the enlarged joint of said leg may be passed through the space presented between said recesses;

bearing means supportingly mounting said disc members on said frame and yieldably biasing said disc members to said spaced apart position;



a poultry leg conveyor mounted on said frame to receive and carry said leg longitudinally between the adjacent stripping edges in a direction substantially perpendicular to said disc members;

first drive means coupled to said disc members for the rotative drive thereof; and

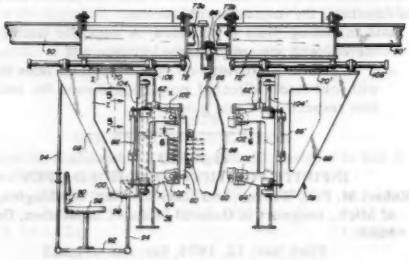
second drive means coupled to said leg conveyor for operation thereof, said second drive means being synchronized with said first drive means whereby to move said enlarged joint of said poultry leg through said recesses when in confronting alignment.

3,965,536

AUTOMATED MEAT TENDERIZATION SYSTEM

William J. Osiadacz, Hoffman Estates, and Alexander J. Nagy, Lake Zurich, both of Ill., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Dec. 9, 1974, Ser. No. 530,672
Int. Cl.² A22C *9/00*
U.S. Cl. 17—25 **2 Claims**



1. In a meat tenderizing system in which a tenderizing solution is injected into a carcass after slaughter, the improvement comprising, in combination: means for storing weight data; motorized means for providing tenderizing solution to a first station; motorized means for providing tenderizing solution to a second station; motorized means for providing tenderizing solution to a third station; a servo-mechanism coupled to each of said motorized means; means providing to each servo-mechanism a signal corresponding to a derived amount of tenderizing solution based upon a weight percentage of the

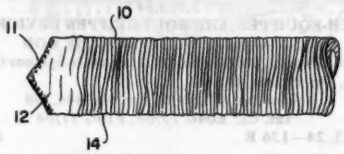
carcass with said motorized means being operatively responsive to said servo-mechanism to provide a derived volume of tenderizing solution; and feedback means from said motorized means to said servo-mechanism to automatically signal said servo-mechanism when said derived volume has been provided.

3,965,537

SHIRRED COLLAGEN CASING STICK HAVING AN END CLOSURE AND METHOD OF MAKING THE SAME

Camilla B. Ross, Hinsdale, and Jerry A. Vos, Tinley Park, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 26, 1975, Ser. No. 562,010
Int. Cl.² A22C *11/02*
U.S. Cl. 17—42 19 Claims



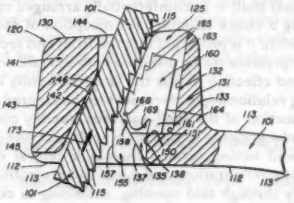
1. A stick of shirred edible tubular food casing having an end closure, said end closure comprising casing material defining an end of said shirred tubular casing having the opposing internal surfaces thereof joined across the full width of said tubular casing obliquely to the longitudinal edges thereof, said end closure being suitable to block the passage of food emulsion from the end of said tubular casing.

3,965,538

INTEGRAL CABLE TIE

Jack E. Caveney, Chicago, and Roy A. Moody, Flossmoor, both of Ill., assignors to Panduit Corporation, Tinley Park, Ill.

Filed May 5, 1969, Ser. No. 821,875
Int. Cl.² B65D *63/00*
U.S. Cl. 24—16 PB 22 Claims



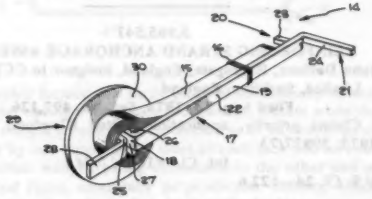
14. An integral one-piece cable tie to be tensioned about a bundle of wires and the like, said cable tie comprising an elongated flexible strap, a row of abutments disposed on one longitudinal surface of said strap and arranged transversely with respect thereto, a frame integral with one end of said strap and including an end wall and an abutment wall, said frame having an opening entry surface and an opening exit surface and a strap-receiving opening extending therethrough, said exit surface sloping toward said entry surface in a direction away from said strap, a ledge on said end wall extending longitudinally therefrom toward said abutment wall, a pawl disposed within said frame in said strap-receiving opening between said ledge and said exit surface, a hinge interconnecting said ledge and the end of said pawl disposed toward said entry surface, the longitudinal extent of said hinge being less than the longitudinal extent of said ledge at the junction therebetween, the longitudinal cross-sectional area of said hinge being less than the longitudinal cross-sectional area of said pawl at the junction therebetween, said pawl and said hinge cooperating so that said pawl is limited to substantially pivotal movement with respect to said frame about the connection to said ledge, said pawl in the as-molded position thereof and in all other positions thereof including the tensioned position thereof being disposed entirely within said frame between the entry and exit surfaces thereof, said abutment wall having a strap-bearing surface disposed toward said pawl and defining therewith a strap-receiving throat, and a set of teeth on said pawl arranged transversely with respect thereto and disposed toward said abutment wall and shaped to engage said row of abutments on said strap, said strap being deformable into a loop encircling a bundle of wires with the free end of said strap extending into said strap-receiving throat and through the opening in said frame and therebeyond, said tooth being disposed toward said row of abutments as said strap is tensioned about the bundle of wires to a tensioned condition and release of said strap causing at least one of said abutments firmly to engage said tooth, any force tending to withdraw said strap from within said strap-receiving throat in a strap-loosening direction serving to move said tooth into more firm engagement with the engaged ones of said row of abutments firmly to grip said strap between said strap-bearing surface and said pawl, whereby to prevent inadvertent withdrawal of said strap from said frame and thus to lock said strap in its tensioned condition about the bundle of wires.

3,965,539

PORTABLE, RELEASABLE TIE-DOWN DEVICE AND METHOD

Steven T. Golden, 822 Teague Drive, Santa Paula, Calif. 93060

Filed June 30, 1975, Ser. No. 591,461
Int. Cl.² A43C *11/00;* A44B *21/00*
U.S. Cl. 24—71.3 17 Claims



1. A portable, releasable tie-down device for quickly and easily applying tension to a flexible elongated member such as a belt, strap, cable, rope or the like, said device comprising:

flexible elongated member storing means for storing said flexible elongated member thereon in overlapping relationship, said storing means including flexible elongated member receiving means adapted to receive thereon a portion of said flexible elongated member, and handle means operatively connected to said member receiving means for rotating said member receiving means, in a non-interfering relationship to said flexible elongated member during rotation of said member receiving mea..s, in a direction adapted to wind said flexible elongated member thereon in overlapping relationship;

contra-rotation preventing means associated with said storing means for preventing rotation of said member receiving means in an unwinding direction when said flexible elongated member is wound in an overlapping relationship on said member receiving means; and

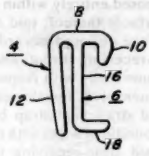
releasing means associated with said storing means for quickly and easily releasing said contra-rotation preventing means to thereby release said member receiving means for rotation in the unwinding direction.

3,965,540

CLIP FOR MOUNTING A CROSSBAR TO A BRACKET

David M. Moore, Pittsburgh, Pa., assignor to Armstrong Store Fixture Corporation, Pittsburgh, Pa.

Filed Jan. 29, 1975, Ser. No. 544,968
Int. Cl.² A44B 13/00
U.S. Cl. 24—84 R 6 Claims



1. An integral clip for mounting a crossbar to a bracket, comprising:

a first member having a cross-section in the form of an inverted J, including

a horizontal portion,

a retaining lip depending from the front end of the horizontal portion, and

a rear wall vertically depending from the rear end of the horizontal portion; and

a second member of L-shaped cross-section, integrally formed with the first member, including

an intermediate wall spaced between the retaining lip and the rear wall, and vertically depending from the horizontal portion of the first member, and

a horizontal shelf extending forwardly from the lower end of the intermediate wall,

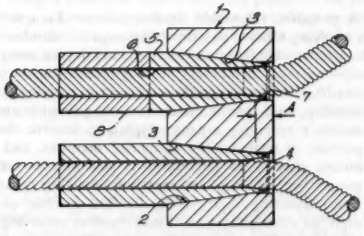
such that when the clip is mounted on the bracket with the bracket located in the space between the rear wall and the intermediate wall, the crossbar may be mounted in the space between the intermediate wall and the retaining lip, and supported by the horizontal shelf.

3,965,541

REINFORCING STRAND ANCHORAGE ASSEMBLY

John Davison, Harrogate, England, assignor to CCL Systems Limited, Surbiton, England

Filed Aug. 13, 1974, Ser. No. 497,126
Claims priority, application United Kingdom, Aug. 23, 1973, 39937/73
Int. Cl.² F16G 11/04
U.S. Cl. 24—122.6 5 Claims



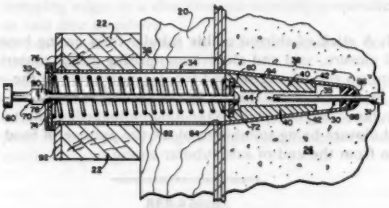
1. A deadend anchorage assembly for prestressed concrete structures, comprising an integral bearing plate having substantially planar end wall and a plurality of transverse openings having parallel axes with each of said openings extending through said planar end wall being adapted to receive a stranded stressing element, and each of said openings, in the position of use in a stressed concrete structure, lying at an angle to the axis of its co-acting stressing element at the point where said stressing element extends out of said bearing plate planar end wall, a frusto-conical wedge device having an axial bore and being positioned between the wall of each of said openings and its co-acting stressing element, each of said openings being in the form of a frusto-conical portion and a cylindrical portion arranged in continuation thereof, said frusto-conical portion forming a major part of the length of said opening and said cylindrical portions of said openings being closely adjacent said end wall, and the relative sizes of each of said openings and its co-acting wedge device being such that the leading or narrow end of said wedge device extends into said cylindrical portion of said opening free of contact therewith, said frusto-conical wedge device bore being of a size to freely receive an intended stressing element, and there being an end stop element for attachment to the end of each stressing element and for engaging the enlarged end of its respective frusto-conical wedge device.

3,965,542

LATCH-EQUIPPED, SHE-BOLT GRIPPER DEVICE FOR A CONCRETE WALL FROM TIE ROD

R. Kirk Gregory, Barrington, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed Jan. 27, 1975, Ser. No. 544,330
Int. Cl.² E04G 17/08; F16G 11/04
U.S. Cl. 24—136 R 6 Claims



1. A gripper device adapted for application to one end of a cylindrical rod and comprising an open-ended, tapered, tubular shell having a frusto-conical front end section and a cylindrical rear end section and embodying wall extending across the rear end of said rear section, a plurality of tapered, tooth-equipped jaw segments slidably disposed within the front end section of said shell in circumferentially arranged relationship and defining a chuck structure for reception of said one end of the rod when it is projected into the front end section of the shell, a compression spring disposed between said wall and jaw segments and effective to bias the latter forwardly in the shell in camming relationship with respect to the tapered wall of the front end section of the shell and thus forcibly collapse said segments into gripping engagement with said one end of the rod, said wall having formed therein a central opening of non-circular configuration, and a pull rod projecting centrally and slidably through said opening, extending in coaxial relation with the shell, rotatable about the longitudinal access of the shell, having its forward end operatively connected in common to the rear ends of said jaw segments, and effective when it is shifted rearwardly against the biasing action of the spring to release said segments from said one end of the rod, and releasable latch means on said pull rod, normally disposed within the confines of the shell, and movable bodily with the pull rod rearwardly through said central opening to a retracted position exteriorly of the shell, said latch means being effective when the pull rod is released to make latching engagement with the edge region of said opening and thus maintain the pull rod in its retracted position, said latch means also being in the form of an enlargement which is formed on the rod, has a cross-sectional shape commensurate to said central non-circular opening, is, in at least one rotational position of the pull rod, capable of passing through said opening, and is, in at least one other rotational position of the pull rod, incapable of passing through said opening.

3,965,543

SHE-BOLT TYPE GRIPPER DEVICE FOR CONCRETE WALL FORM TIE RODS OF INDETERMINATE LENGTH

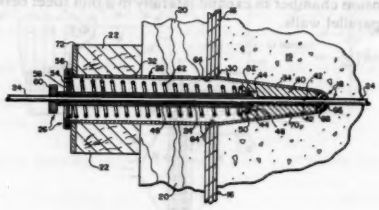
Frank T. Connors, Deerfield, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Continuation-in-part of Ser. No. 526,076, Nov. 22, 1974, Pat. No. 3,910,546. This application Jan. 27, 1975, Ser. No. 544,179

The portion of the term of this patent subsequent to Oct. 7, 1992, has been disclaimed.

Int. Cl.² E04G 17/08; F16G 11/04

U.S. Cl. 24—136 R 4 Claims



1. As a new article of manufacture, a gripper device designed for use as a she-bolt in gripping the outer end region of a tie rod in associated relation with a concrete wall form, said device comprising a tubular shell having a frusto-conical front section and a cylindrical rear section, tooth-equipped jaw segments slidable in said front section and defining a chuck structure for reception therethrough of the tie rod, a circular wall extending across the rear end of the shell, a compression spring interposed between said wall and jaw segments and effective to bias the latter forwardly into tie rod-gripping relationship, an elongated cylindrical pull tube through which the tie rod is adapted to extend to any desired extent including through the open rear end of the tube, said pull tube projecting centrally and slidably through said circular wall coaxially with the shell and being capable of sliding movement longitudinally on the tie rod, said pull tube having its forward end operatively connected in common to the rear ends of the chuck segments and effective when pulled rearwardly to release such segments from the tie rod, and a radial flange carried on the rear end of said hollow pull tube exteriorly of the shell and disposed in close proximity to said circular wall, said flange, in combination with said circular wall, constituting a pry-head by means of which the pull tube may be pried rearwardly with respect to the shell.

3,965,544

LOCKING DEVICE WITH COMBINED WEDGING AND SPRING ACTION

Ogden W. Boden, 1580 Gaywood Drive, Altadena, Calif. 91001

Filed June 11, 1975, Ser. No. 585,792

Int. Cl.² F16G 11/00

U.S. Cl. 24—136 R 20 Claims

1. A locking device comprising:

a body containing a passage having two opposite side walls;

a slide contained at least partially within said passage and movable essentially along a predetermined axis relative to said body;

said slide having two arms with gripping portions located opposite said two side walls respectively in a relation defining two paths at opposite sides of said slide along which two elongated flexible elements can extend between said arms and side walls;

said side walls having portions which converge toward one another as they advance in essentially a predetermined axial direction and which are positioned laterally opposite said gripping portions of said arms at locations to clamp said elements tightly between said gripping portions and said opposed converging portions of said side walls and thereby positively lock said elements against movement in said predetermined direction, by a wedging action resulting from the convergence of said wall portions;

said arms being yieldingly urged relative to one another in opposite lateral directions and toward said two converging portions of said side walls respectively to clamp said elements thereagainst independently of said wedging action, and being actuable inwardly away from said side walls to release said elements.

3,965,545

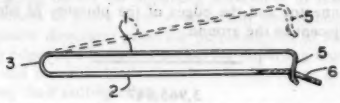
BELT BUCKLE

Lars Johansson, 631 Hicksville Road, Far Rockaway, N.Y. 11691

Filed May 28, 1975, Ser. No. 581,550

Int. Cl.³ A44B 11/22, 11/24

U.S. Cl. 24—186 9 Claims



1. A buckle formed of a single piece of substantially inflexible material having a front face and, parallel thereto when the buckle is closed, a back face, connected at an adjacent end of each face by two hinges at the sides of each face and an integral frictional wedged prong connected to the other end of one of said faces, essentially perpendicular thereto, which prong engages the opposite face in a positive locking manner.

3,965,546

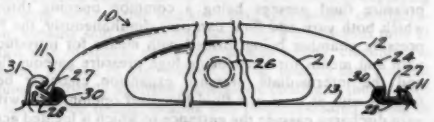
PLASTIC FILM CONNECTOR FOR INFLATABLE STRUCTURES

Jerry J. Hickle, Findlay, Ohio, assignor to R. L. Kuss & Co., Inc., Findlay, Ohio

Filed Aug. 7, 1975, Ser. No. 602,883

Int. Cl.² A44B 21/00; E04B 1/34

U.S. Cl. 24—243 K 5 Claims



1. A film connector for retaining and connecting in air-tight relationship the edges of a plurality of film layers, comprising:

an elongated base member of generally a horizontal J cross sectional shape with a central flat horizontal portion and one upwardly rolled edge defining a curve passing

through more than 180°, the rolled edge having a generally cylindrical inside surface, said base member also including a generally flat rearward retaining edge opposite the rolled edge;

an elongated locking member to be received by the base member, said locking member in cross section having a central flat portion, an upwardly curved edge shaped complementarily to the generally cylindrical inside surface of the base member, and a rearward edge opposite the upwardly curved edge;

said base member further including upwardly extending yieldable lock-down means between the retaining edge and the central flat horizontal portion for receiving and retaining in snap-in fashion the rearward edge of the locking member;

said locking member being sized to lie on the base member with its upwardly curved edge engaged within the generally cylindrical inside surface of the base member and its rearward edge engaged by the yieldable lock-down means,

whereby, when the plurality of film layers are placed along the upper surface of the base member from the lock-down means over the flat horizontal central portion and along the generally cylindrical inside surface of the upwardly rolled edge, said locking member may be inserted into the base member with its upwardly curved edge adjacent to the generally cylindrical inside surface and the film layers positioned therebetween, then the rearward edge of the locking member may be pushed downwardly to force the yieldable lock-down means back and to snap into engagement with the yieldable lock-down means, thereby engaging the plurality of film layers and establishing an air-tight relationship between the layers when the layers are placed in tension outside of the connector; and

ground-engaging fastening means connected to the locking member and to the base member for retaining the film connector and the edges of the plurality of film layers adjacent to the ground.

3,965,547

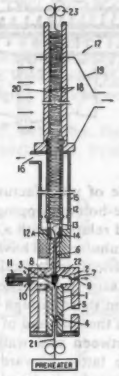
APPARATUS FOR PRODUCING BULKED YARNS

Duncan Cameron Ferrier; Thomas Berry, both of Tiverton, England, and Karel Murenbeeld, Geneva, Switzerland, assignors to John Heathcoat & Co. Ltd., Tiverton, England

Division of Ser. No. 130,899, April 5, 1971, Pat. No. 3,810,285. This application May 21, 1973, Ser. No. 362,350
Claims priority, application United Kingdom, Apr. 6, 1970, 16192/70; June 29, 1970, 31381/70
Int. Cl.[2] D02G *1/20, 1/16, 1/12*
U.S. Cl. 28—1.3 **28 Claims**

1. Apparatus for bulking yarn incorporating a high pressure fluid passage and an intermediate pressure expansion chamber into which the passage debouches, the passage being formed with an entry for yarn and an entry for high pressure gaseous fluid spaced upstream from said expansion chamber such that yarn will become impregnated with high pressure fluid in said passage, a high pressure chamber from which the high pressure fluid passage leads to the intermediate pressure chamber, the entry for yarn and for high pressure fluid to the high pressure fluid passage being a common opening through which both yarn and fluid can pass simultaneously, the high pressure chamber being formed with means for introducing yarn and means for introducing high pressure gaseous fluid, and the intermediate pressure expansion chamber being formed with at least one fluid bleed-off opening and with a yarn discharge passage the entrance to which is located across the chamber from the debouchment of the high pressure fluid passage and containing a yarn deflecting surface also located across the chamber from the debouchment of the high pressure fluid passage.

9. Apparatus for bulking yarn incorporating a high pressure fluid passage and an intermediate pressure expansion chamber into which the passage debouches, the passage being formed with an entry for yarn and for high pressure gaseous fluid, the intermediate pressure expansion chamber being formed with a yarn discharge passage the entrance to which is located across the chamber from the debouchment of the high pressure fluid passage and containing a yarn deflecting surface also located across the chamber from the debouchment of the high pressure fluid passage, at least one bleed-off opening provided in the intermediate pressure expansion chamber, and two laterally extending parallel walls between which the high pressure fluid passage debouches into the intermediate pressure expansion chamber for constraining fluid issuing from the high pressure fluid passage into the intermediate pressure expansion chamber to expand laterally in a thin sheet between said parallel walls.



11. Apparatus for producing bulked multifilament yarn in which the yarn filaments are separated to a predetermined extent, comprising impregnating and carrying means for impregnating a multifilament yarn with a gaseous fluid at one pressure and carrying the yarn continuously forward in a stream of the fluid, expansion means comprising an expansion chamber for causing the fluid to expand suddenly to a lower pressure chosen to cause the fluid as it expands outwardly to separate the yarn filaments to an extent greater than said predetermined extent, and deflecting and carrying means, including a deflecting surface in said chamber against which the separated filaments are brought and a yarn discharge passage from said chamber, for causing said filaments to come toward one another in an amount such that the yarn filaments are separated to the said predetermined extent, and for carrying the yarn continuously forward in a second stream of the fluid, said expansion chamber having at least one bleed-off opening for fluid.

3,965,548

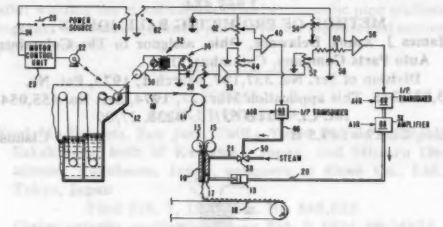
CRIMPER STARTUP METHOD AND SYSTEM

Edward William James, II, Oxford, Pa., and Warren Eugene Kenney, Waynesboro, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 31, 1975, Ser. No. 546,129
Int. Cl.[2] D02G *1/12*
U.S. Cl. 28—1.7 **4 Claims**

4. In a system for drawing and crimping tow including a driven draw machine from which tow is continuously passed to a stuffer box crimper having a feed means, along with an adjustable steam supply and an adjustable counterpressure means, an apparatus for adjusting both the crimper steam supply and the adjustable counterpressure means according to draw machine speed as the machine speed increases during

startup comprising: a tachometer coupled to the draw machine for detecting draw machine speed and generating first signals proportional thereto; means coupled to said tachometer for combining said first signals with second signals of constant magnitude to produce third signals; control means



responsive to said third signals for changing the adjustable steam supply; control means responsive to said third signals for changing the adjustable counterpressure means; and a time lag device connected to said means for producing third signals for momentarily delaying the third signals for changing the adjustable counterpressure means.

3,965,549

MANUFACTURE OF SOLID METAL SPHERICAL ARTICLES

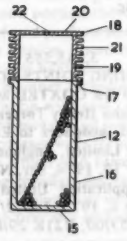
William Melville, Handsworth, England, assignor to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

Filed Oct. 18, 1974, Ser. No. 516,017

Claims priority, application United Kingdom, Oct. 31, 1973, 50607/73

Int. Cl.² B21K *21/06*

U.S. Cl. 29—1.22 **9 Claims**



1. A method of manufacturing solid spherical articles from initial non-spherical preforms of a material which permits deforming of the preforms, comprising tumbling a charge of such preforms with a quantity of liquid coolant in a rotating barrel, the liquid having an evaporation temperature below the softening temperature of the material of the preforms so that the liquid is heated to its evaporation temperature by the tumbling action of the preforms, condensing the resulting vapor and returning the distillate to the preforms, and continuing the process until the preforms are deformably reshaped by their tumbling action to spherical articles.

3,965,550

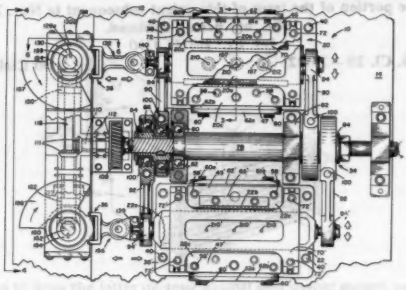
MACHINE FOR MAKING EXPANDED METAL

David B. Parkinson, Cleveland Heights, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Division of Ser. No. 388,400, Aug. 15, 1973, Pat. No. 3,893,214. This application Dec. 17, 1974, Ser. No. 533,690

Int. Cl.² B21D *31/02*; B26D *5/08*

U.S. Cl. 29—6.2 **8 Claims**



1. Apparatus for expanding metal strip comprising:

a. first and second movable blade members each having at least one cutting edge;

b. first and second stationary blade members respectively mounted for cooperation with said first and second movable blade members;

c. support means for supporting each of said movable blade members for independent guided movement in at least two directions in a common plane; and

d. drive means for said blade members, said drive means including means for imparting movement to said blade members to move them substantially simultaneously in opposite directions generally perpendicular to their cutting edges and including means for imparting movement to said movable blade members in directions generally along their cutting edges.

3,965,551

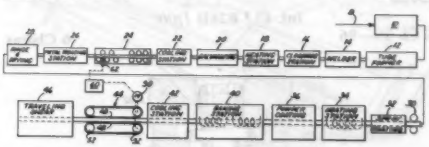
PRODUCTION OF POLYMER-COATED STEEL TUBING

Arthur E. Ostrowski, Crete, Ill., assignor to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Aug. 14, 1975, Ser. No. 604,622

Int. Cl.² B21B *15/00*

U.S. Cl. 29—33 D **15 Claims**



10. A method for producing coated tubing from steel strip, which method comprises the steps of continuously supplying steel strip, roll-forming said steel strip into tubular configuration, welding said roll-formed strip into a continuous tube at a fast rate of speed, sizing said welded tubing, cleaning the exterior surface of said welded tubing, heating said cleaned tubing, uniformly applying a polymeric coating to the exterior of said heated tubing, heating said polymer-coated tubing to a desired baking temperature, rapidly lowering the temperature of said baked coated tubing, said heating, coating and baking being performed while said tubing is physically unsupported, gripping said tubing over a longitudinal distance of at least about two feet and pulling said tubing in a manner so as to maintain said tubing in precise spatial location throughout said heating, coating and baking.

3,965,552
PROCESS FOR FORMING INTERNAL CONDUCTORS AND ELECTRODES

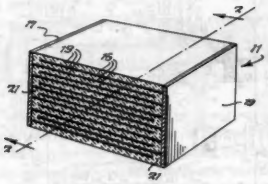
Truman C. Rutt, Niagara Falls, N.Y., assignor to N L Industries, Inc., New York, N.Y.

Division of Ser. No. 274,668, July 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 134,689, April 16, 1971, Pat. No. 3,679,950. This application June 10, 1974, Ser. No. 478,181

The portion of the term of this patent subsequent to Nov. 20, 1900, has been disclaimed.

Int. Cl.² H01G *4/30*

U.S. Cl. 29—25.42 **30 Claims**



1. A process for providing conductive areas in a sintered ceramic body which comprises: providing sheets of a finely divided non-conductive ceramic composition bonded with a fugitive bond, which composition forms a dense layer when fired to sintering temperature, introducing between said sheets a deposit of a second composition having a fugitive bond, said composition developing an open structure when fired; consolidating a plurality of said sheets and intervening deposits whereby to obtain a fugitive-bonded, self-sustaining body; heating said body to eliminate said fugitive bonds; firing said body to sintering temperature to produce a sintered monolithic body having areas of dense ceramic material and open-structured areas having interconnected voids, each such open-structured area extending to an edge region of said monolithic body; and providing a conductive material in said open-structured areas by impregnating them with molten metal.

3,965,553
TOOLHOLDER

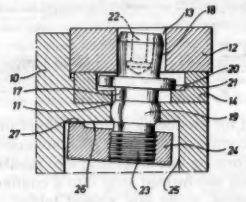
Kurt Heinrich Albert Erich Faber, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Filed Oct. 10, 1975, Ser. No. 621,599

Claims priority, application Sweden, Oct. 18, 1974, 7413133

Int. Cl.² B26D *1/00*

U.S. Cl. 29—96 **6 Claims**



1. Toolholder for clamping an apertured cutting insert (**12**) into an insert-receiving site in a holder body so that the insert rests on a base surface and engages with at least one lateral abutment surface, there being a clamp pin (**17**) rotatably and pivotably received in a bore (**11**) in the holder while extending into the aperture (**13**) of the insert, characterized in that the pin is supported axially in the holder and provided with a threaded portion (**23**) threadedly engageable by a locking plate (**24**), said plate being non-rotatably received in an enlarged portion of the bore (**11**), said arrangement being such that said plate, when said pin is in-screwed, pivots into a position where said plate is caused axially to abut against a shoulder abutment (**26**) in the bore at the same time as the portion (**18**) of the pin projecting into the aperture of the insert engages therewith and urges the insert against its lateral abutment or abutments.

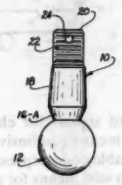
3,965,554
METHOD OF PRODUCING BALL JOINTS

James J. Amos, Delaware, Ohio, assignor to The Columbus Auto Parts Company, Columbus, Ohio

Division of Ser. No. 337,187, March 1, 1973, Pat. No. 3,831,245. This application Mar. 27, 1974, Ser. No. 455,054

Int. Cl.² B21D *53/10*; B23K *27/00*

U.S. Cl. 29—149.5 B **4 Claims**



1. A method of producing ball joints comprising, in combination, forming a stem portion from a stem work-piece in a forging die, said work-piece including a concave ball-receiving end, a thread-receiving end, forging a reverse tapered portion at said ball receiving end; forming a ball portion from a ball work-piece of metal stock; mounting said ball portion in a first die portion; mounting said stem portion in a second die portion; imparting relative rotation to said die portions while applying axial force to said work-pieces against one another at confronting surfaces; upsetting said work-pieces at said confronting surfaces by frictionally applied heat to metallurgically bond said work-pieces at a fused junction of said confronting surfaces; removing flashing produced by the welding at said junction; and mounting said ball and stem assembly in a ball joint housing with said ball portion pivotally supported by a bearing means, said reverse taper on said stem portion providing high angularity of movement of said stem portion with respect to said housing.

3,965,555
METHOD OF FORMING JOINTS FOR PROTECTIVELY LINED OR COATED METAL

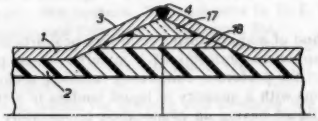
John David Webster, and Henry Torrens A. Bowman, both of St. Austell, England, assignors to English Clays Lovering Pochin & Company Limited, England

Filed June 10, 1974, Ser. No. 478,113

Claims priority, application United Kingdom, Mar. 22, 1974, 12988/74; June 6, 1973, 28679/73

Int. Cl.² B21D *53/00*; B21K *29/00*; B23P *15/26*

U.S. Cl. 29—157 R **3 Claims**



1. in a method of joining together first and second pipe members, each of which comprises a metallic pipe section having a coating on a surface thereof of a heat-degradable material, by forming a welded joint between abutting metal

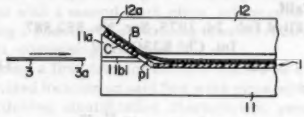
edges of the metallic pipe sections, the improvement which comprises the steps of (i) constructing the metallic pipe section for each of the first and second pipe members so that at one end portion at least thereof it diverges away from the axis of said metallic pipe section; (ii) securing a heat shield to the inside of each divergent end portion of each of the metallic pipe section; (iii) applying the heat-degradable material to the metallic pipe section and to said heat shield to coat the same; (iv) aligning the metal edges of the divergent end portions of second pipe sections and urging them together; and (v) thereafter welding the metal edges of the two metallic pipe sections together to form the desired joint between the first and second pipe members.

3,965,556

JACKET HOLDER

Fred M. Sanchez, San Jose, Calif.; Yukio Shirai; Toshiyuki Sakakibara, both of Kawasaki, Japan, and Mitsuru Ohminato, Yokohama, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Feb. 7, 1975, Ser. No. 548,023
Claims priority, application Japan, Feb. 8, 1974, 49-16675
Int. Cl.² B23P *19/00*
U.S. Cl. 29—200 J **10 Claims**



1. A jacket holder for holding a jacket to permit strips of film to be inserted therein, said jacket being of the type comprising, in combination, a base and a cover each made of pliable material and forming therebetween one or more pockets for storing strips of film therein, said pockets being disposed parallel to each other and each having an inlet for the film formed on the cover side and in the vicinity of one end portion in the longitudinal direction of the pocket, said jacket holder comprising: first and second members; spacing means for holding said jacket between said first and second members such that a space is maintained therebetween sufficient to permit a strip of film to be inserted into the pocket of the jacket held thereby with the cover disposed adjacent the first member; said first member including a raised inclined surface portion formed at the end portion thereof on the side corresponding to the inlets of said pockets and adapted to push and bend said jacket at the portion where the inlets exist toward said base when the jacket is held between the first and second members; said second member including a recessed inclined surface portion cooperating with said raised inclined surface portion when holding the jacket; and said first member including film strip inserting passageways formed at the end portion thereof on the side on which said raised inclined surface is provided and extending through the raised inclined surface portion parallel to and in alignment with the pockets of said jacket when held by the first and second members.

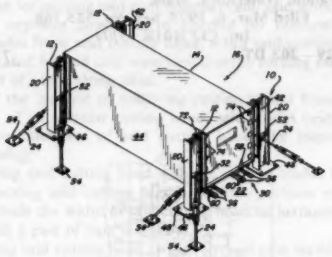
3,965,557

APPARATUS FOR AFFIXING PREALIGNED CORNER POSTS TO BOX-LIKE STRUCTURES BEFORE ASSEMBLING SAME

Robert L. Pruitt, Jr., 10001 Hendrix Court, N.E., Albuquerque, N. Mex. 87111

Filed Aug. 1, 1974, Ser. No. 493,763
Int. Cl.² B23P *19/00*
U.S. Cl. 29—200 J **9 Claims**

1. A corner-forming jig for aligning the corners of a room module or the like preparatory to joining two or more thereof together in assembled relation which comprises: a set of at least two rigid stanchions anchored in upstanding spaced parallel relation to one another, each of said stanchions having a vertically-disposed planar surface, and said planar surfaces paralleling one another; spacer means of uniform thickness effective when interposed between the planar surface of said stanchion and a flange of a structural steel corner post placed alongside thereof to maintain a minimum fixed spaced relationship therebetween; and, fastener means bridging the space between said stanchion and corner post operative upon actuation to draw the latter up snug against said spacer means, each of said stanchion, spacer means and fastener means subassemblies functioning independently of one another upon actuation to straighten the corner post associated therewith, and said subassemblies cooperating with one another to maintain said corner posts thus straightened in fixed spaced parallel relation to one another while being permanently attached to adjacent corners of a box-like structure placed therebetween.

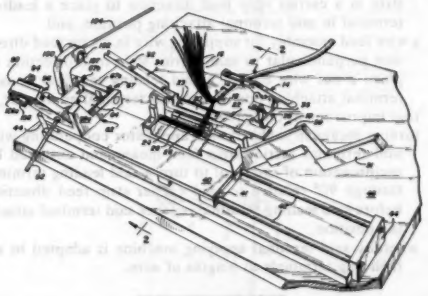


3,965,558

WIRE TERMINATION APPARATUS

William H. McKee, West Covina, Calif., assignor to TRW Inc., Elk Grove Village, Ill.

Continuation of Ser. No. 502,085, Aug. 30, 1974, abandoned.
This application June 12, 1975, Ser. No. 586,453
Int. Cl.² H01R *43/04*
U.S. Cl. 29—203 MW **15 Claims**



1. Apparatus for simultaneously effecting solderless termination of a plurality of wires in a connector of the type having a plurality of terminals with the electrical contact portions of each terminal disposed within a separate terminal recess, comprising first means for supporting a plurality of insulated wires in predetermined, spaced, parallel relation to one another at spacings corresponding to the spacing of such recesses of such a connector, second means for supporting such a connector in a position such that said wires are juxtaposed with said recesses of a connector supported on said second means, means for effecting relation movement between said first and second means in a direction generally normal to the longitudinal axes of said wires and thereby positioning said wires in confinement engagement with said recesses, and

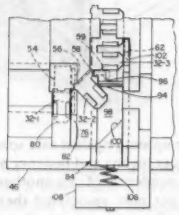
means engageable with each of said wires after said wires are so confined in said recesses for forcing each of said wires into electrically conductive engagement with the contact portions of the terminal in the respective recess.

3,965,559

FLAG TERMINAL APPLYING MACHINE

Ralph Mazzola, Boston, Mass., assignor to Ark-Les Switch Corporation, Watertown, Mass.

Filed Mar. 6, 1975, Ser. No. 555,788
Int. Cl.² H01R *43/04*
U.S. Cl. 29—203 DT **7 Claims**



1. In an automatic terminal applying machine for attaching terminals to lengths of wire, said terminals being supplied to said machine attached sidewise to one another to form a terminal strip, said machine having

a terminal applicator including

a base,

a tool reciprocable with respect to said base, said tool and base defining a terminal attaching position and including cooperating terminal attaching means actuated on reciprocation of said tool, and

terminal carrier strip feed means for feeding said carrier strip in a carrier strip feed direction to place a leading terminal in said terminal attaching position, and

a wire feed assembly for supplying wire in a wire feed direction perpendicular to said carrier strip feed direction to place a cut wire end in a said leading terminal in said terminal attaching position in said terminal applicator,

that improvement comprising

turning means in said terminal applicator cooperating with said terminal carrier strip feed means and actuated by reciprocation of said tool to turn a said leading terminal through 90° relative to said carrier strip feed direction before said leading terminal reaches said terminal attaching position,

whereby said terminal applying machine is adapted to attach flag terminals to lengths of wire.

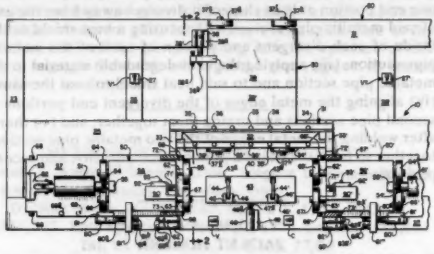
3,965,560

CORNER KEY MACHINE

James Carson Jackson, Baton Rouge, La., assignor to James Carson Jackson, Richmond, Va.

Filed Feb. 3, 1975, Ser. No. 546,212
Int. Cl.² B23P *19/04*
U.S. Cl. 29—208 R **18 Claims**

1. An apparatus for inserting a key member in an opening in a lineal member or shape comprising a frame, and mounted on said frame, a shape feed means for moving the shape to a preset location for receiving the key member, shape stop means for stopping the shape at the preset location for receiving the key member, and key feed means for inserting the key member in the lineal member or shape, said shape feed means including a shape support unit, and said shape support unit including shape support means, shape pick bar means



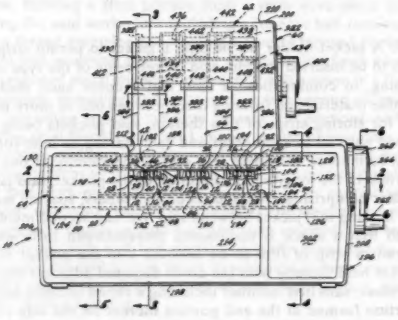
mounted thereon and shape guide means mounted on said pick bar means.

3,965,561

MACHINE FOR PLACING SUBSTANTIALLY FLAT, OPEN-THROATED ELEMENTS ON RODS

Tony Rhodes, Torrance, and Derek John Gay, Palos Verdes Peninsula, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 24, 1975, Ser. No. 552,587
Int. Cl.² B23Q *7/10*
U.S. Cl. 29—211 R **11 Claims**



1. A machine for placing a substantially flat, open-throated element on a rod by passing the open-throat portion of said element past said rod transversely to the major axis thereof, comprising:

1. means for holding said element with its open-throat portion unobstructed;

2. means for supporting said rod with its major axis adjacent said unobstructed open-throat portion of said element, said supporting means comprising:

A. a first L-shaped way positioned above said holding means, said first L-shaped way having a first leg lying in a substantially horizontal plane and a second leg depending from said first leg normal thereto in a vertical plane behind said rod;

B. a second L-shaped way positioned below said holding means, said second L-shaped way having a first leg lying in a horizontal plane and a second leg upstanding from said first leg of said second L-shaped way normal thereto in a vertical plane behind said rod; and

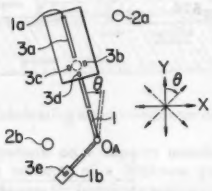
C. resilient pawl means pressing said rod against said second legs; and

3. means connected to said holding means for moving said holding means toward said supported rod a sufficient distance to pass said open-throat portion of said held element past said rod.

3,965,562
METHOD AND APPARATUS FOR POSITIONING CONTROL

Tadao Inoyama, Yokohama, both of Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 20, 1975, Ser. No. 542,303
Claims priority, application Japan, Jan. 18, 1974, 49-7922; Feb. 1, 1974, 49-12747
Int. Cl.² B23Q *17/00*
U.S. Cl. 29—407 **16 Claims**

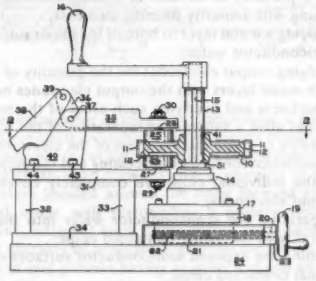


1. A method of positioning a first work piece in a prescribed alignment with a second work piece, said second work piece containing a plurality of positioning identification characteristic points, comprising the steps of:
   a. aligning a first detector defined relative to a first predetermined location on said first work piece with one of said positioning identification characteristic points on said second work piece; and
   b. rotating said first work piece relative to said second work piece about an axis passing through said first predetermined location on said first work piece and said one of said positioning identification characteristic points on said second work piece until another of said positioning identification characteristic points on said second work piece is aligned with a second detector defined relative to a second predetermined location on said first work piece.

3,965,563
METHOD AND APPARATUS FOR REMOVING CUTTING BLADES FROM AN ANNULAR CUTTING HEAD

William L. Schaefer, Gibsonia, and Thomas J. Briar, Trafford, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 8, 1975, Ser. No. 575,903
Int. Cl.² B23P *19/02*
U.S. Cl. 29—427 **7 Claims**



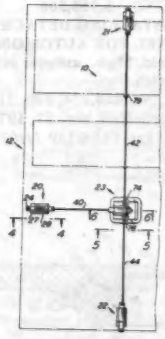
1. In an apparatus for removing cutting blades from the periphery of an annular cutting head, said blades being longer than the thickness of said cutting head, the combination comprising:
   a working table;
   means for mounting said cutting head on said working table;
   means for rotating said cutting head about its axis;
   a pair of free wheeling cam members positioned to contact said blades at their portions extending beyond the width of the cutting head, the curved portions of said free wheeling cam members contacting the edges of the blades juxtaposed to the cutting edges, one of said cam members being removably mounted and both of said cam members being supported independent of said working table;
   means for moving said cam members and said working table in opposite directions to provide for removal of said blades from said cutting head, when said cutting head is rotated by said cam members thereby forcing said blades out of said cutting head.

6. In the method of removing cutting blades from the periphery of an annular cutting head, said blades being longer than the thickness of said cutting head, the improvement comprising:
   rotating said cutting head with the cutting blades therein;
   contacting said cutting blades at their portions extending outside the width of said cutting head on juxtaposed sides with a pair of cam members,
   moving said cutting head away from said cam members, and rotating said cutting head to force said blades out of their mounting.

3,965,564
METHOD OF MAKING A LATCHING ASSEMBLY

Mike J. Slovensky, Jr., Twinsburg, Ohio, assignor to Cleveland Hardware & Forging Co., Cleveland, Ohio

Division of Ser. No. 483,110, June 26, 1974, Pat. No. 3,910,611, which is a continuation of Ser. No. 237,715, March 24, 1972, Pat. No. 3,834,747. This application Mar. 24, 1975, Ser. No. 561,350
The portion of the term of this patent subsequent to Sept. 10, 1991, has been disclaimed.
Int. Cl.² B23P *19/00*
U.S. Cl. 29—434 **1 Claim**



1. A method of providing a manually operative latching assembly for a door comprising the steps of:
   a. providing a plurality of latch members having latch pins movable between inward and outward directions and continually biased in the outwardly direction;
   b. providing an operating assembly including a pivotally mounted substantially flush handle driving a reciprocating sliding member;
   c. positioning said latch members along marginal edges of the door at locations wherein said latch pins can engage keepers;

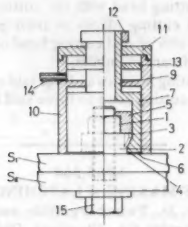
d. positioning said operating means at a desired location on said door;
e. interconnecting said sliding member with said latch pins by lengths of flexible cable; and
f. tensioning said lengths of cable an amount sufficient to allow said latch pins to move simultaneously upon movement of said sliding member but not an amount sufficient to hold said pins in retracted position.

3,965,565

METHOD OF AND APPARATUS FOR TIGHTENING HIGH-STRENGTH STEEL BOLTS

Kaneharu Fujii, No. 502, Tatzunodai, Zama Kanagawa, Japan

Filed June 4, 1975, Ser. No. 584,028
Int. Cl.² B23P 11/02
U.S. Cl. 29—446 1 Claim



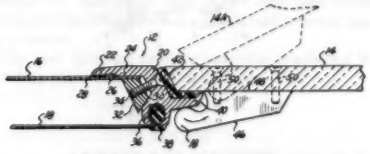
1. A method of tightening a high-strength steel nut and bolt combination comprising the steps of:
initially threading said nut to said bolt;
introducing a pre-stress tension into said bolt by means of a compressive force exerted on said nut threaded thereto;
tightening said nut on said bolt under said pre-stress tension; and then
releasing said force acting against said nut.

3,965,566

METHOD OF INSTALLING DETACHABLE SUN ROOF PANEL FOR AUTOMOBILES

Hal Green, Southfield, Mich., assignor to Empire Automotive, Inc., Ferndale, Mich.

Division of Ser. No. 444,274, Feb. 21, 1974, Pat. No. 3,913,971. This application May 27, 1975, Ser. No. 580,987
Int. Cl.² B23P 11/02
U.S. Cl. 29—451 3 Claims



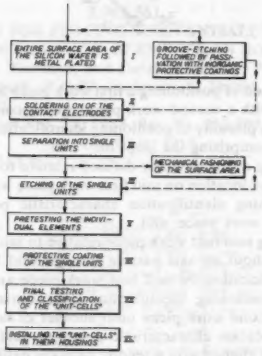
1. The method of adapting a conventional vehicle roof having a hard outer shell and a flexible headliner formed beneath the shell, to receive a removable sun roof panel, comprising: cutting an aperture in the roof panel and the headliner; disposing an elongated molding having a tapered section and a groove around the perimeter of the aperture; securing the molding to the shell by affixing wedges to the molding at the tapered section so as to engage the roof shell between the molding and the wedges; and disposing the edge of the headliner in the molding groove and securing it therein with a strip which extends into the groove.

3,965,567

METHOD FOR PRODUCING DIFFUSED CONTACTED AND SURFACE PASSIVATED SEMICONDUCTOR CHIPS FOR SEMICONDUCTOR DEVICES

Wolfgang Beerwerth, Neheim-Husten; Albrecht Geppert, Warstein; Horst Gesing, and Rigobert Schimmer, both of Belecke, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed June 28, 1974, Ser. No. 484,629
Claims priority, application Germany, June 28, 1973, 2332822
Int. Cl.² B01J 17/00
U.S. Cl. 29—574 40 Claims

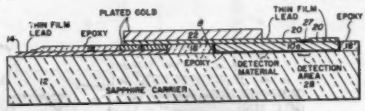


1. Method for producing diffused, contacted and surface passivated semiconductor chips for semiconductor devices, comprising the steps of:
a. producing a given arrangement of layers and regions of different conductance and different conductivity types for a plurality of devices in a semiconductor wafer by doping with impurity forming elements;
b. applying a metal layer to both of the major surfaces of the semiconductor wafer;
c. applying output electrodes for the plurality of devices to both metal layers with the output electrodes having such a thickness and overlying such areas of the metal layers so that after a subsequent separation of the wafer into a plurality of chips the thickness of the electrodes will still be sufficient for further processing and the major surfaces of the individual chips are completely covered by the output electrodes;
d. separating the semiconductor wafer into the intended plurality of individual contacted chips;
e. etching the exposed semiconductor surfaces of the individual contacted chips;
f. measuring the operating characteristics of the individual chips;
g. repeating steps (e) and (f) as required until the measured chip has satisfactory operating characteristics; and
h. providing the exposed semiconductor surfaces of the chips with satisfactory operating characteristics with a protective layer.

3,965,568
PROCESS FOR FABRICATION AND ASSEMBLY OF SEMICONDUCTOR DEVICES

Roland W. Gooch, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 392,148, Aug. 27, 1973, abandoned.
This application June 5, 1975, Ser. No. 583,927
Int. Cl.² B01J 17/00
U.S. Cl. 29—583 11 Claims



1. A method for fabricating a semiconductor device consisting of:

forming a lead pattern on a support member, said lead pattern having contacts of a thickness greater than a preselected thickness for forming a semiconductor device on said support member;

bonding a semiconductor chip with an insulating adhesive to the support member in a spaced relationship to the contacts, said semiconductor chip having a thickness greater than said preselected thickness, and said adhesive also filling the space between the semiconductor chip and the contacts;

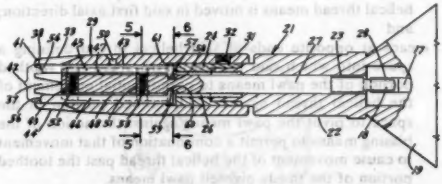
lapping the semiconductor chip, the adhesive, and the support member lead pattern contacts in a single removal operation to form a coplanar surface and to form a semiconductor device by reducing the thickness of said semiconductor chip to said preselected thickness; and

forming conductive leads on said coplanar surface for connecting the semiconductor device to the support member lead pattern contacts.

3,965,569
CUTTING APPARATUS

Lee R. Bolduc, 4624 W. 28th St., Minneapolis, Minn. 55416

Continuation of Ser. No. 498,313, Aug. 19, 1974, abandoned.
This application Aug. 18, 1975, Ser. No. 607,204
Int. Cl.² B26B 19/14
U.S. Cl. 30—29.5 10 Claims

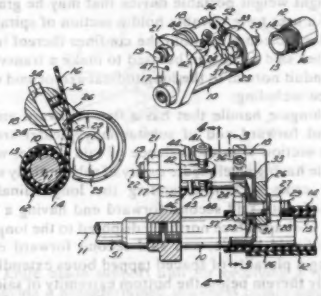


1. An apparatus for cutting hair comprising: a housing, an elongated generally cylindrical cutter means mounted on the housing operable to cut hair, said cutter means having a sleeve member with an open forward end, a plurality of forwardly directed teeth located around the open forward end, and a cylindrical inside wall surrounding a passage open to the forward end, adjacent teeth being spaced from each other to provide a plurality of separate V-grooves for accommodating hair, each of said grooves having an inner end and an open end whereby hair can move through the open outer end into the grooves between adjacent teeth, blade means located in the passage, said blade means comprising a pair of elongated bar members, each bar member having an elongated outer surface extended along the length of the bar member in surface engagement with the inside cylindrical wall, a linear cutting edge extended along one side of the outer surface, and generally flat sides, a rotatable member located in the passage, said rotatable member having an outer end located in general transverse alignment with the inner ends of the grooves in the sleeve member, said rotatable member having an outwardly directed annular rib, said cutter means having an inwardly directed annular shoulder cooperating with the rib to limit the longitudinal movement of the rotatable member, said rotatable member being a cylindrical member having two pairs of circumferentially spaced longitudinal walls forming a pair of longitudinal grooves located on diametrically opposite sides of the member, said bar members being located in said longitudinal grooves for rotation with the rotatable member, parts of the sides of said bar members being engageable with the longitudinal walls forming the longitudinal grooves, said bar members having outer end portions extended outwardly from the outer end of the rotatable member, said linear cutting edges of said end portions on rotation of the rotatable member cooperating with the teeth to cut the hair extended through the grooves in the sleeve member, means for biasing the blade means into engagement with the cylindrical inside wall, said means for biasing including a spring mounted on the rotatable member and engageable with the bar members, drive means connected to the rotatable member to move the blade means relative to the teeth to cut hair extended through the grooves in the sleeve member between adjacent teeth, and means engageable with the bar members and rotatable member to limit longitudinal movement of the bar members relative to the rotating member.

3,965,570
HOSE SKIVING TOOL

Robert E. Kozulla, Willowick, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Apr. 21, 1975, Ser. No. 569,979
Int. Cl.² B21F 13/00; B26B 27/00
U.S. Cl. 30—90.1 9 Claims



1. A skiving tool for hose comprising cutter means, positioning means for laterally positioning a hose with respect to said cutter means for relative rotation between said hose and tool about a first axis, a support arm member connected to said positioning means, a tool post member mounted on said support arm member for adjustment rotation relative thereto about a second axis spaced from said first axis, said cutter means mounted on said tool post member operable upon relative rotation between said tool and hose about said first axis to engage such hose at a location spaced from said first axis and skive a layer therefrom, and adjusting means operable to adjustably move said tool post member relative to said support arm member about said second axis and to lock said members in adjusted positions; said adjusting means including a screw threaded into one of said members and engageable with a surface on the other of said members wherein both said screw and said surface are spaced from said second axis, and a spring connected between said members maintaining said

screw and surface in engagement during adjustment, said cutter means including a disc cutter journalled on said tool post member and adapted to radially cut into a hose, and a separate chisel-type cutter having a cutting edge positioned adjacent to the inner extremity of said disc cutter, the cutting edge of said chisel-type cutter extending generally in a longitudinal direction with respect to a hose supported by said positioning means, said disc cutter being mounted in a phase perpendicular to said first axis.

3,965,571

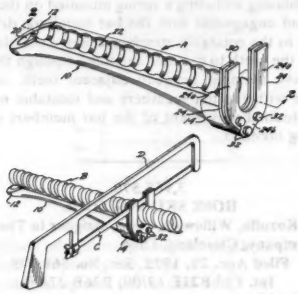
FLEXIBLE SPIRALLY WOUND CONDUIT CUTTING DEVICE

Richard G. Lyman, 408 E. 230th St., Carson, Calif.

Filed June 30, 1975, Ser. No. 591,778

Int. Cl.² B21F *11/00*; B26B *27/00*

U.S. Cl. 30—90.2 **2 Claims**



1. In combination with a hacksaw having a thin elongate blade, a light weight portable device that may be grasped by a hand of a user to removably hold a section of spiral wound flexible electric conduit within the confines thereof in such a position that said blade can be used to make a transverse cut in said conduit normal to the longitudinal axis of said conduit, said device including:

a. an elongate handle that has a first rearward end and a second forward end of substantially greater transverse cross section than the balance of said handle, with said handle having an elongate cavity of substantially semi-circular cross section extending the longitudinal length thereof, with said second forward end having a flat forward U-shaped face normally disposed to the longitudinal axis of said handle, and said second forward end face having a plurality of spaced tapped bores extending rearwardly therein below the bottom extremity of said cavity, and said cavity having a plurality of longitudinally spaced transverse recesses defined therein that engage the exterior surface of said spirally wound conduit to prevent the latter moving longitudinally in said handle when said conduit is being cut by said blade;

b. first and second rigid U-shaped guide plates, each of said guide plates including two transversely spaced legs having free first ends extending above said handle to a height above a conduit to be cut and second ends that merge below said cavity into a transverse web, and each of said plates having a plurality of openings in said web that are axially alignable with said tapped bores;

c. spacer means for separating said first and second plates and defining a space therebetween of a width greater than the thickness of said blade; and

d. a plurality of bolts that extend through said openings to engage said tapped bores to removably secure said first and second rigid plates and spacer means to said second end of said handle to permit a section of said spirally wound conduit resting in said handle to be cut when said blade is reciprocated in said space in sawing contact with said conduit.

3,965,572

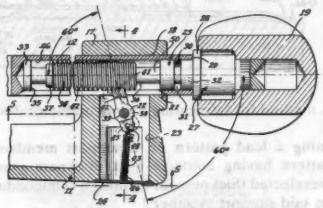
TUBE CUTTER

Richard V. Strybel, Elk Grove Village, Ill., assignor to Imperial-Eastman Corporation, Chicago, Ill.

Filed Oct. 21, 1975, Ser. No. 624,555

Int. Cl.² B23D *21/08*; B25B *13/16*, *5/22*

U.S. Cl. 30—102 **20 Claims**



1. In a manually operable tool having a movably element, a mounting element, and a carrier movable carried on the mounting element for positionably adjustably carrying the working element, means defining a helical thread carried by said carrier, manually rotatable means for rotating said thread means about the helical axis thereof, and pawl means having a toothed portion engageable with said helical thread, the improvement comprising:

pivot means pivotally mounting said pawl means to said mounting element adjacent said helical thread means;

biasing means engaging said pawl means for biasing said pawl means to urge said toothed portion into mated association with said helical thread, the pivot axis of said pivot means being spaced from said helical thread means a preselected distance to cause said pawl means toothed portion in a forwardly angled position to drivingly engage said helical thread when the helical thread means is moved in a first axial direction and permit said helical thread to move past said toothed portion when the helical thread means is moved in a second, opposite axial direction, and in a rearwardly angled position to permit said helical thread to move past said toothed portion when the helical thread means is moved in said first axial direction; and

means at opposite ends of said helical thread defining a space into which said biasing means urges said toothed portion of the pawl means to permit initial movement of the helical thread against said toothed portion in the space to pivot the pawl means against the action of the biasing means to permit a continuation of that movement to cause movement of the helical thread past the toothed portion of the thusly pivoted pawl means.

3,965,573

AUTOPSY APPARATUS FOR ASSISTING THE CUTTING OF BRAIN TISSUE

George P. Mims, Memphis, Tenn., assignor to Sandra J. Vorus, Memphis, Tenn.

Filed Mar. 24, 1975, Ser. No. 561,186

Int. Cl.² B26B *11/00*, *29/02*

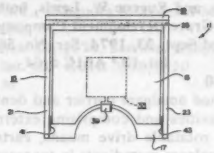
U.S. Cl. 30—124 **6 Claims**

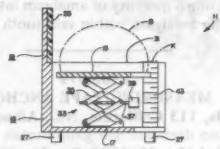
1. Apparatus for use in autopsies to assist in the cutting of brain tissue with an autopsy knife, said apparatus comprising:

a. holding means for holding and restraining movement of the brain tissue as the autopsy knife is passed through the brain tissue;

b. guide means located adjacent said holding means for guiding the autopsy knife through the brain tissue as the

brain tissue is restrained by said holding means, said holding means including a horizontally disposed platform member for supporting the brain tissue, said horizontal platform member being movable relative to said guide means for allowing the brain tissue supported on said platform member to be positioned at different locations relative to said guide means, and





c. scale means located adjacent said guide means and said movable platform member for allowing said movable platform member to be adjustably positioned in graduated degrees relative to said guide means thus the autopsy knife may selectively be guided through various predetermined areas of the brain tissue while being supported on said platform member.

3,965,574

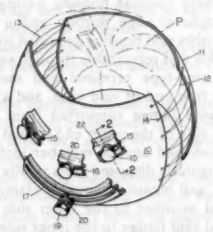
APPARATUS FOR FORMING A JACK-O-LANTERN

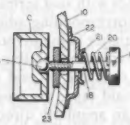
Harry Edwin Graves, 3219- 135th St., Toledo, Ohio 43611

Filed Sept. 29, 1975, Ser. No. 617,482

Int. Cl.² B26B *11/00*, *29/02*

U.S. Cl. 30—124 **2 Claims**





1. Apparatus for forming a jack-o-lantern comprising

a. a pair of plates of sheet material curved to engage opposite sides of a pumpkin,

b. releasable means for connecting the adjacent edge portions of said plates for holding same in place against a pumpkin,

c. holes in one of said plates appropriately arranged for the eyes, nose and mouth of a jack-o-lantern,

d. cutters shaped appropriately for the eyes, nose and mouth adapted to cut through and remove portions of the wall of a pumpkin,

e. an instrument for each of said cutters to extend through the respective hole in said plate.

f. each instrument having a stem extending through a plate hole and engaging a cutter disposed on the inside of such plate,

g. a clamping plate on the inside of such plate in screw threaded engagement with said stem,

h. a clamping plate on the outside of and engaging such plate, and through which said stem freely extends,

i. an operating wheel on the outer end of said stem, and

j. a coil spring between said wheel and said outside clamping plate.

3,965,575

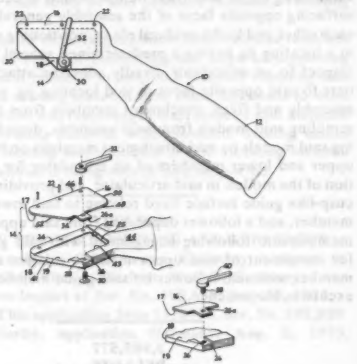
KNIFE BLADE SUPPORT UNIT

Edward R. Stunger, Greenville, S.C., assignor to Bigelow-Sanford, Inc., Greenville, S.C.

Continuation-in-part of Ser. No. 498,253, Aug. 19, 1974, abandoned. This application Apr. 21, 1975, Ser. No. 569,784

Int. Cl.² B26B *1/08*, *3/08*

U.S. Cl. 30—294 **5 Claims**



1. A knife blade support unit for receiving a replaceable blade having a predetermined thickness comprising

a blade-receiving slot defined by a rigid base member and a flexible second member, each said member having a blade engaging inner surface,

said base member providing an open channel including a surface portion continuous with said base member inner surface and extending therefrom,

said second member providing a tongue alignable with said base member channel and including a surface portion continuous with said second member inner surface and extending therefrom,

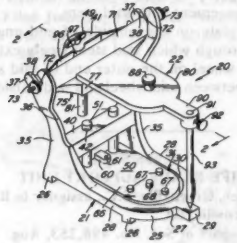
means spaced from said channel and tongue maintaining said inner surfaces fixed along a first edge of said defined slot spaced from said channel and tongue with a predetermined separation substantially equal to said predetermined blade thickness,

a clamping member passing through said channel and tongue, and

an elongated tightening lever for said clamping member lying in a plane generally parallel to said defined slot and rotatable in said plane,

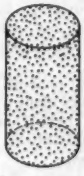
whereby force applied to said lever is transferred through said clamping member to urge together said inner surfaces securing said blade therebetween.

3,965,576
DENTAL APPARATUS AND METHOD
Melborne D. Eveland, 1006 Buena Vista Road, Forked River, N.J. 08731
Filed May 15, 1974, Ser. No. 470,197
Int. Cl.² A61C 11/00
U.S. Cl. 32—32 9 Claims



1. In a dental method, the steps which comprise: detachably assembling upper and lower dental models in centric relation, surfacing opposite faces of the assembly generally parallel to each other and to the occlusal plane, positioning said assembly in a locating jig having a predetermined spacial relation with respect to an articulator, fixedly adhering attachment members to said opposite faces in said locating jig, removing said assembly and fixed attachment members from the jig, disassembling said models from said assembly, detachably mounting said models by said attachment members on the respective upper and lower members of an articulator for centric location of the models in said articulator, and providing an internal cusp-like guide surface fixed relative to said lower articulator member, and a follower depending from said upper articulator member into following engagement with said guide surface, for movement of said upper member relative to said lower member with said follower on said guide member to simulate excursive movement.

3,965,577
PELLETS
Gunther Wegner, Neuenhain, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Division of Ser. No. 323,434, Jan. 15, 1973, abandoned. This application May 15, 1974, Ser. No. 470,317
Claims priority, application Germany, Jan. 13, 1972, 7201061[U]
Int. Cl.² A61C 3/00
U.S. Cl. 32—40 R 4 Claims

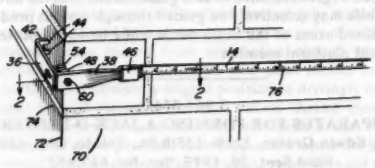


1. A halocarbon impregnated pellet of an elastic soft cellular plastic material having open pores of a volumetric weight from 25 to 40 kg/m³ and having a number of pores from 10 to 20/cm suitable for determining the vitality of tooth pulpa.

3,965,578
COMBINED AMALGAM CARRIER AND DENTAL HANDPIECE
Fuller Warden, and Eugene W. Lewis, both of Tulsa, Okla., assignors to Grace Development Company
Filed Sept. 23, 1974, Ser. No. 508,256
Int. Cl.² A61C 5/04
U.S. Cl. 32—60 14 Claims

1. A combined amalgam carrier and dental handpiece for filling tooth cavities and comprising external power source means having rotatable drive means, cartridge means preloaded with amalgam ingredients in separate sealed compartments, mixing means provided in said cartridge means, said mixing means being removably engagable with said drive means for actuation thereby for release of the amalgam ingredients from the respective sealed compartments and to combine and mix the amalgam ingredients within said cartridge to produce amalgam, plugger means carried by said power source means and reciprocal with respect to said cartridge means for ejecting a quantity of amalgam into the tooth cavity and packing the amalgam within said tooth cavity.

3,965,579
MEASURING TAPE ANCHOR
Lee W. Woods, 113 California, NE., Albuquerque, N. Mex. 87108
Filed May 19, 1975, Ser. No. 578,905
Int. Cl.² G01B 3/10
U.S. Cl. 33—137 R 2 Claims



1. In combination with a conventional tape rule of the type including a generally circular housing having a slot formed through one peripheral edge portion and a coiled flexible measuring tape within said housing provided with one free end portion protractible and retractable through said slot, a generally rectangular ring-type terminal end member pivotally mounted on said free end of said tape, and a right angularly extending apertured flange supported from and projecting outwardly of one side of the outer end of said end member; a rigid generally L-shaped anchor member including a pair of generally right-angularly disposed arms rigidly interconnected at adjacent ends, and means removably clampingly attaching said terminal end member to the inner side of one of said adjacent ends and said flange to the inner side of the other of said adjacent ends with said terminal end and flange generally paralleling the corresponding adjacent ends of said arms, said terminal end member being pivotally attached to the free end of the tape for oscillation relative thereto about an axis generally paralleling one side of said end member and extending transversely of said tape, the free end portion of one of said arms including an angularly directed terminal end projecting into the included angle formed by said arms, at least the inner side of the free end portion of the other of said arms including a resilient bumper portion, the length of said arms of said anchor member being such to enable the latter, when said tape is substantially fully retracted within said housing, to be positioned against said housing embracing approximately one-

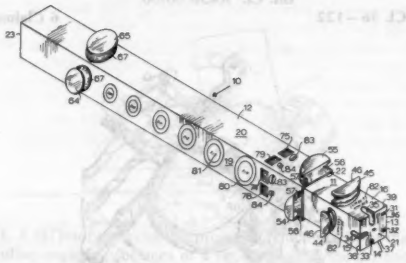
quarter of the external periphery thereof and with the juncture between said arms spaced outwardly of said slot.

3,965,580

DEVICE FOR DETERMINING THE SIZE DASH NUMBER OF STANDARD O-RINGS

James S. Bogart, Farmington Hills, Mich., and John M. Wilcox, Columbia, S.C., assignors to Federal-Mogul Corporation, Detroit, Mich.

Filed Oct. 29, 1974, Ser. No. 518,610
Int. Cl.² G01B 5/08, 3/20
U.S. Cl. 33—143 M 7 Claims



1. A device for determining the size dash number of standard O-rings, including in combination:

a pair of telescoping elongated prisms, comprising an outer prism and an inner prism mated to each other and slidable relative to each other, said outer prism including a first end and a second end, said inner prism at all times projecting from said first end of said outer prism and having an end wall,

one of said prism having means for determining the thickness category of each standard O-ring,

each face of said inner prism having at least one projection having a flat surface parallel to and facing away from said end wall, all said flat surfaces of all said projections lying in a common plane and providing stop means,

said outer prism having on each face thereof at said first end at least one projection for matching each projection of said inner prism and forming a mating stop means limiting inward telescopic movement of said inner prism, the matching pairs of projections providing means for supporting O-rings and being keyed to said means for determining the thickness category,

said outer prism also having on at least some faces adjacent said second end thereof, an additional O-ring supporting projection,

said outer prism having near each said projection an aligning means for each projection, each said aligning means lying on the same face as its corresponding projection and keyed thereto,

said inner prism having thereon identifying dash numbers in columns, each column being aligned with a said aligning means and each number being so aligned as to appear in a readable portion aligned with said aligning means when an O-ring is supported by both a projection of said inner prism and a projection of said outer prism, and when said inner prism is extended to a position where said O-ring is taut but not stretched, and

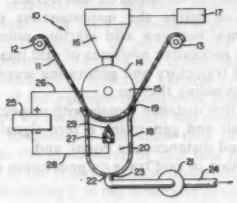
printed silhouettes in shapes of standard O-rings too small to enable installation on said projections, said silhouettes being desplayed on faces of said outer prism between the said projections of each respective face along with their dash numbers and along the longitudinal axis of said face which extends in the direction of the extension of said inner prism so that such small-diameter O-rings can be matched by silhouette to give the proper dash number.

3,965,581

LIQUID REMOVING METHOD AND APPARATUS

James T. Candor, 5440 Cynthia Lane, Dayton, Ohio 45429

Continuation-in-part of Ser. No. 469,820, May 14, 1974, and a continuation-in-part of Ser. No. 405,023, Oct. 10, 1973, and Ser. No. 499,178, Aug. 21, 1974, Pat. No. 3,893,898. This application Feb. 10, 1975, Ser. No. 548,666
Int. Cl.² F26B 3/34, 3/36
U.S. Cl. 34—1 20 Claims



1. Apparatus for removing moisture from web-like moisture bearing fibrous material comprising means for supporting and moving said material in strip-like fashion, vibrating means for vibrating said moving and supported material to work the fibers thereof, and dielectric heating means for heating said moisture in said moving and supported and vibrating material to remove at least some of said moisture from said vibrating material.

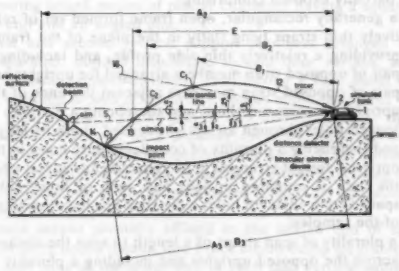
6. A method for removing moisture from web-like moisture bearing fibrous material comprising the steps of supporting and moving said material in strip-like fashion, vibrating said supported and moving material with vibrating means to work the fibers thereof, and removing at least some of said moisture from said vibrating material with dielectric heating means dielectrically heating said moisture in said vibrating material while said material is being moved and supported.

3,965,582

GUNNERY PRACTICE METHOD AND APPARATUS

Gerd von Bennigsen, Geisenbrunn, Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 493,658, July 30, 1974, abandoned. This application June 11, 1975, Ser. No. 585,820
Claims priority, application Germany, Aug. 2, 1973, 2339164
Int. Cl.² F41G 3/26
U.S. Cl. 35—25 9 Claims



1. A method of simulating a projectile firing operation comprising the steps of:

automatically and continuously generating and displaying a trajectory trace corresponding to the trajectory of an imaginary projectile from a given starting point over

terrain taking into account an estimated distance between the desired impact point and said starting point, the azimuth angle and elevational angle of firing of said projectile, and the characteristic path of the selected projectile type;

training a range finder from a position generally at said starting point through successive points on said trajectory corresponding to instantaneous successive positions of said imaginary projectile thereon and generating first distance signals corresponding to the instantaneous straight-line first distance from said position through said successive points to locations on said terrain;

automatically calculating the instantaneous straight-line second distance between said starting point and said instantaneous successive positions of said imaginary projectile on said trajectory and generating second distance signals corresponding thereto;

comparing said first distance signals with respective second distance signals and generating a zero signal when said first and second distances are equal; and

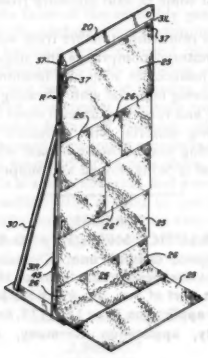
stopping generation of said trace on generation of said zero signal.

3,965,583

DISPLAY RACK FOR CARPET SAMPLES

Raymond C. Price, Rte. 3 Box 392, Golden, Colo. 80401

Filed May 23, 1975, Ser. No. 580,237
Int. Cl.² G09B *25/00*
U.S. Cl. 35—55 **9 Claims**



1. A carpet sample display rack for releasably supporting a plurality of generally rectangular carpet samples each being at least partially exposed comprising:

a. a generally rectangular, open frame formed set of relatively thin straps lying flatly in the plane of the frame, providing a relatively thin side profile, and including a pair of opposed strap members arranged for uprights and pair of opposed strap members adjacent the ends of the uprights as cross members, and therebeing a plurality of spaced holes through an upright spaced along its length and therebeing a plurality of complementary holes in the opposed upright arranged to be generally horizontal when the rack is mounted upright and each of holes being spaced from adjacent holes a distance less than the height of the samples;

b. a plurality of span straps of a length to span the distance across the opposed uprights and including a plurality of holes therethrough, with a pair of holes adjacent the outer ends of each span strap spaced to generally align with a pair of complimentary holes in the opposed uprights, and including a plurality of holes intermediate said outer holes arranged to coincide with the width of carpet samples held thereon;

c. a plurality of fasteners arranged to pass at least partially through the holes, pairs of which releasably secure each span strap to complimentary holes in said uprights, and pairs of which secure carpet samples to said straps and said span straps; and

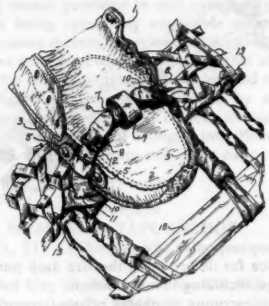
d. means for supporting said rack in upright position.

3,965,584

FOOTWEAR AND ATTACHMENT ASSEMBLY FOR SNOWSHOEING

Maurice Beaulieu, 120 Dequoy St., St. Gabriel de Brandon, Quebec, Canada

Filed Dec. 9, 1974, Ser. No. 531,194
Int. Cl.² A43B *00/00*
U.S. Cl. 36—122 **6 Claims**



1. A footwear and attachment assembly for snowshoeing comprising a footwear including a front foot portion having a pair of lateral walls, a pair of strap portions secured against the outer face of said lateral walls respectively, projecting lengthwise of said footwear transversely adjacent the articulation of the toes, and having an intermediate loose portion forming an upright passage, and a pair of tying straps insertable through said upright passages respectively, securable to each other over said front foot portion at said articulation, and each having a bottom end securable to an underlying snowshoe.

3,965,585

SHOE ATTACHMENT FOR SPORTS

Sherwin R. Stewart, 5844 Denny Ave., North Hollywood, Calif. 91601 5N

Filed Aug. 7, 1975, Ser. No. 602,682
Int. Cl.² A43B *00/00*
U.S. Cl. 36—125 **7 Claims**

1. A shoe attachment device for use in connection with a variety of sports including snow, beach surf, sand walking and the like comprising a pair of foot devices wherein each of said foot devices consists of:

an elongated platform having opposite ends terminating in close proximity to the toe and heel of the user's shoe;

a continuous sidewall integrally carried on said platform extending in parallel along the opposite sides of said platform;

a portion of said continuous sidewall constituting the front end of said platform and including an outwardly projecting lip;

said lip incasing a length of reinforcement rod so as to stiffen and rigidize said front end;

adjustable attachment means operably carried on said platform for detachably coupling the heel and toe of the user's shoe;

said attachment means including a toe piece having a pair of halves pivotally carried on said platform for lateral rotational movement towards the opposing surfaces of said sidewalls;

parallel runner means detachable carried on the underside of said platform so as to downwardly depend therefrom; and

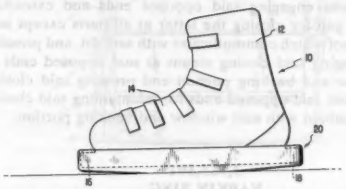
releasing means interconnecting said runner means with said platform for removing and detaching said runner means.

3,965,586

SKI BOOT COVER

Friedrich Roosli, 315 E. 77th St., New York, N.Y. 10021

Filed July 28, 1975, Ser. No. 599,608
Int. Cl.² A43B *1/10*
U.S. Cl. 36—7.3 **7 Claims**



1. A ski boot protector for preserving the integrity of the ski binding-engaging surfaces of a ski boot when the ski boot is not engaged with a binding, said protector being formed of elastic material and comprising:

an elongate sole protector portion sized to conform generally to the shape and plan view area of a ski boot sole;

forward and rear upstanding end wall members extending upwardly from said protector portion at the opposite ends thereof and each end wall member presenting an inner surface adapted to engage the forward and rear projecting ends of a ski boot sole, each end wall member extending from side-to-side of said sole protector portion and each having a cover flange likewise extending from side-to-side of said sole protector portion, the cover flanges being dimensioned to overlie and substantially to cover the projecting forward and rear ends of a ski boot sole; and

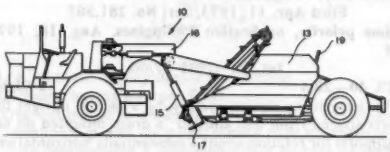
an upstanding side wall member extending along each side of said sole protector portion and integrally joining said end wall members, said side wall members being spaced apart closely to engage along opposite sides of a ski boot.

3,965,587

QUICK DROP CONTROL FOR SCRAPERS

Robert C. Johns, Jr., Lubbock, Tex., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Nov. 13, 1974, Ser. No. 523,307
Int. Cl.² B60P *1/36*; F15B *11/08*
U.S. Cl. 37—8 **2 Claims**



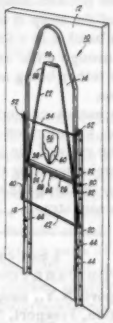
1. In a mobile earth moving scraper, a bowl to hold, haul and dump earth material, an hydraulic cylinder operable to raise or lower the front of the a bowl, a blade on the front of the bowl engageable with the ground when the bowl is lowered for digging earth material to fill the bowl, the improvement comprising a control including a main valve having a valve spool shiftable from a neutral position to one of three fluid control positions corresponding to up, down or quick drop control functions of the hydraulic cylinders, a pump, a reservoir connected with the pump through the main valve with the valve spool in the neutral position, a first line carrying hydraulic fluid under pressure from the pump through the main valve when the valve spool is in the up position to one end of the hydraulic cylinder causing the bowl to be raised, a second line connecting the other end of said cylinder through the main valve with the reservoir when said valve spool is in said up position, a check valve in the first line checking any exhaust flow to the reservoir from the one cylinder end in the up position, a source of pilot pressure, a pilot operated valve connected to the source of pilot pressure in the down or quick-drop positions, a bypass line connected to said first line above the check valve directing exhaust cylinder flow from the one end of the cylinder through the pilot operated valve when actuated by the pilot pressure and returning it below the check valve to unseat it and allow flow through the check valve back to the main valve by said first line returning the exhaust flow to the reservoir in the down position of the main valve or recirculating it to the other end of the cylinder in said quick drop position.

3,965,588

IRONING BOARDS

Harry L. Long, P.O. Box 1057, Norman, Okla. 73069

Filed May 19, 1975, Ser. No. 578,602
Int. Cl.² D06F *81/00*
U.S. Cl. 38—103 **4 Claims**



1. An ironing board assembly for use in combination with a selected vertical supporting door surface, comprising:

ironing board means of planar character having a squared end and an angled end;

first and second vertical support members arranged for parallel, bonded disposition to said door surface, said vertical support members each having a base panel for bonding to said door surface and an additional panel for receiving the squared end of said ironing board in rigid affixure as well as a plurality of brace receiving slots disposed at selected height from the door surface bottom;

first and second securing means for pivotally securing the squared end of said ironing board to said first and second vertical support members;

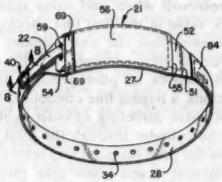
brace means pivotally affixed to the angled end of said ironing board means, said brace means being securable in said slots at the lower end of each said vertical support member to brace said ironing board means in its horizontal operative position; and

second securing means of resilient consistency affixed to said first and second vertical support members and adaptable to retain said ironing board means in a stored position parallel to said vertical door surface.

3,965,589
IDENTIFICATION MEANS

Clifton Eugene McDermott, Salt Lake City, Utah, assignor to Bio-Logics Products, Inc., Salt Lake City, Utah

Filed Feb. 12, 1975, Ser. No. 549,426
Int. Cl.² G09F 3/14
U.S. Cl. 40—21 C 7 Claims

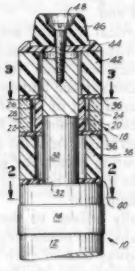


1. A composite identification band comprising:
- a flexible plastic strap having located near one end thereof a lower pocket having an exposed opening at one end;
- an upper pocket superimposed on said lower pocket having exposed openings at both ends;
- a pocket partially overlying said upper pocket and open at one end;
- a pocket longitudinally aligned with and adjacent to said upper and lower pockets along said strap having an exposed opening at one end;
- male fastening means at the end of the strap containing said upper and lower pockets adapted to receive apertures in the other end of the strap in any of several possible positions when the band is in a looped condition;
- a tether looped through a flat encoded identification plate, one end of the tether being adapted to fit over the male fastening means;
- female fastening means carried by the other end of the tether adapted to interlock with said male fastening means when the ends of the tether are superimposed on each other thereby securing the strap in a looped condition and further securing the tether and encoded identification plate to said strap.

3,965,590
ARTICLES FOR CARRYING IDENTIFICATION

Isaac Algaze, Freeport, N.Y., assignor to Rich Cue of Valley Stream Corporation, Freeport, N.Y.

Filed Jan. 3, 1975, Ser. No. 538,310
Int. Cl.² G09F 3/18
U.S. Cl. 40—19 10 Claims

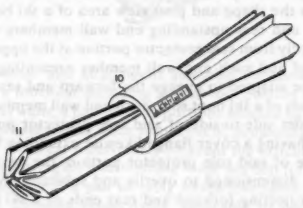


1. In an article which is to carry identification, an assembly having an interior backing portion and an outer window situated in front of and spaced from said backing portion to define therewith a gap situated between said backing portion and window, said backing portion being visible through said window and said window being formed with a slit through which a strip can be introduced into said gap to become situated between said backing portion and window so that a surface of said strip becomes visible through said window, said assembly including a closing means closing said gap at all parts thereof except a region of said gap which communicates with said slit so that access may be had to said gap only through said slit, and said assembly having a portion removably carrying said strip so that the latter may be removed from the latter portion of said assembly and then introduced through said slit into said gap after a desired identification has been placed on said surface of said strip which becomes visible through said window after said strip has been introduced into said gap, said window and backing portion having opposed ends and said closing means engaging said opposed ends and extending across said gap for closing the latter at all parts except said region thereof which communicates with said slit, and pressing means engaging said closing means at said opposed ends of said window and backing portion and pressing said closing means against said opposed ends for maintaining said closing means assembled with said window and backing portion.

3,965,591
NAPKIN RING

Alice E. J. Le Sueur, Cobble Hill, Canada, assignor to The Raymond Lee Organization, New York, N.Y., a part interest

Filed Nov. 26, 1974, Ser. No. 527,216
Int. Cl.² G09F 3/14
U.S. Cl. 40—21 R 3 Claims



1. A napkin ring in the form of a hollow cylinder fitted with readily replaceable and interchangeable identification means, comprising
- a hollow cylinder formed with a recess in an external face of the ring,
- a strip of material fixed in said recess below the external surface of the ring, and
- a plurality of plates, each externally marked with a symbol, that fit onto said strip in the recess, with said plates and strip joined to each other by magnetic means.

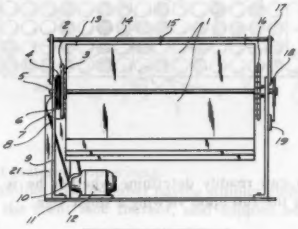
3,965,592
ADVERTISING DEVICE

Alfredo M. Anos, 6 Anak-Bayan St., San Francisco del Monte, Quezon City, Philippines

Filed Apr. 11, 1973, Ser. No. 281,503
Claims priority, application Philippines, Aug. 18, 1971, 12758
Int. Cl.³ G09F 27/00
U.S. Cl. 40—28.1 9 Claims

1. An advertising device comprising a pair of upright first supports spaced from one another; a drum mounted on said first supports for rotation about a substantially horizontal axis; means for rotating said drum so that successive portions thereof reach a front region of said device which is directed to an observer of the device and including a drive shaft; a plurality of information bearing sheets mounted on said drum for pivoting about axes parallel to the axis of said drum; means for displaying the information on successive sheets momentarily positioned at said front region of said device, said dis-

playing means including a pair of second supports attached to said first supports and extending therefrom to a location above said front region of said drum, and limiting means connected to said second supports and including portions contacting a respective one of said successive sheets and holding the same in a substantially vertical position for a predetermined period of time; a tape recorder operative for reproducing audible signals pertaining to the information displayed by said displaying means and recorded on a magnetic tape, said tape recorder having a capstan connected to said drive shaft so as to share the rotation thereof and adapted to contact the magnetic tape; and means for synchronizing the signals with the information displayed by said displaying means, including a transmission between said drum and said drive shaft operative for establishing a proportion between the rotation of said drive shaft and the rotation of said drum so that said capstan advances the magnetic tape through said tape recorder at a speed proportionate to the speed of rotation of said drum.



3,965,593

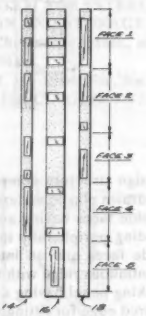
NUMERIC DISPLAY USING THREE ENDLESS BELTS

Robert J. Harruff, Pardeeville, Wis., assignor to General Indicator Corporation, Pardeeville, Wis.

Filed Nov. 18, 1974, Ser. No. 524,746

Int. Cl.² G09F *11/28*

U.S. Cl. 40—32 **1 Claim**



1. A numeric display device comprising:

a housing having an open front,

three endless belts mounted in the housing in side-by-side relationship with each belt reeved over rollers in serpentine fashion with a continuous face portion of each belt facing outwardly through the open front of the housing, each of the three belts having only five face portions,

one of the belts having indicia on each of its five face portions while each of the other two belts has indicia on four face portions and a blank fifth face portion,

the indicia on the three belts being combinable in the open front to form any desired numeral from 0–9,

means driving each belt independently of the others so as to enable the various face portions to be positioned in the open front,

and guide means in the open front between adjacent belts to guide the edges of each belt.

3,965,594

FRAME CONSTRUCTION FOR A PLURAL PAGE DOCUMENT

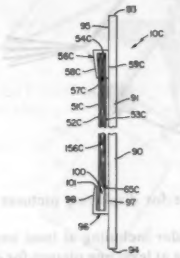
James T. Candor, 5440 Cynthia Lane, Dayton, Ohio 45429

Continuation of Ser. No. 374,936, June 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 336,989, March 1, 1973, Pat. No. 3,807,071, which is a continuation-in-part of Ser. No. 271,925, July 14, 1972, abandoned. This application Sept. 23, 1974, Ser. No. 508,084

The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.

Int. Cl.² G09F *1/12*

U.S. Cl. 40—104.02 **7 Claims**



1. A picture-like frame construction exhibiting a plural page document comprising a plural page document, a back support for supporting said frame construction in a substantially vertical manner on a wall, desk, etc., said back support having a clamping channel means adjacent the top thereof for defining at least part of an open area within said frame construction and leading from the front thereof to said back support and clamping and holding adjacent top parts of said pages in serial hinged stacked relation in the channel thereof so that said pages are disposed in serial stacked relation in said open area in such a manner that the outermost page appears to be the only page framed in the open area but permitting all of said pages to be manually fanned out through said open area thereof for individual viewing thereof, and a folded transparent flexible sheet receiving said top parts of said pages of said document in the fold thereof, said fold of said sheet being clamped in said channel of said clamping channel means whereby the outer part of said folded sheet covers the outermost page of said plural page document when the same are disposed in said stacked relation in said open area and tends to give the appearance that the same is a glass panel covering the outermost page of said document, said frame construction having another channel means adjacent the bottom of said back support and having the channel thereof facing toward the channel of the first mentioned channel means while being spaced below the bottom parts of said pages and loosely receiving the bottom edge of said outer part of said sheet to hold said sheet and the bottom parts of said pages in unfanned relation at the bottom thereof until it is desired to fan the same out through said open area by bowing said outer part of said sheet to remove the bottom edge thereof from its respective channel whereby once said outer part of said sheet has its bottom edge thereof removed from its respective channel all of the bottom parts of said pages are free to be fanned out of said open area as the same are spaced above the respective channel whereby the differential in length between said outer part of said sheet and said pages permits said sheet to lock said

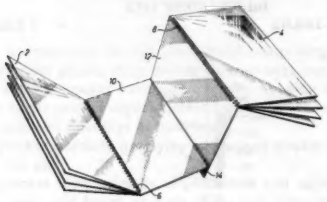
bottom parts of said pages in said unfanned relation when said outer part of said sheet is received in said respective channel.

3,965,595

MOUNTING DEVICE OR BOOK FOR STORING, DISPLAYING AND HANDLING TRANSPARENT PICTURES

Erik Kjellqvist, Stockholm, Sweden, assignor to Almqvist & Wiksell Forlag AB, Sweden

Continuation of Ser. No. 183,804, Sept. 27, 1971, abandoned. This application Dec. 16, 1974, Ser. No. 533,078
Claims priority, application Sweden, Oct. 6, 1970, 13539/70
Int. Cl.² G09F *11/06*
U.S. Cl. 40—104.18 **6 Claims**



1. A mounting device for displaying pictures in a random sequence, comprising:

a first picture set holder including at least one transparent picture sheet having at least one picture for display, a first carrier member and first means pivotally mounting said at least one transparent picture sheet to one edge of said first carrier member;

a second picture set holder for holding at least two pictures for display, said second picture set holder including at least two transparent picture sheets having at least one picture on each of said picture sheets for display, and a second carrier member, said first mounting means pivotally mounting said at least two transparent picture sheets to one edge of said second carrier member, for rotation about a common pivot axis through an angle of substantially **360°** about said common pivot axis; and

second means pivotally mounting said first and second carrier members to each other at their respective opposite edges from said one edge of each said carrier member for movement relative to a display area border of said first picture set holder such that any of said at least two picture sheets is selectively superimposable on said at least one transparent picture sheet of said first picture set holder.

3,965,596

IMPROVEMENTS IN OR RELATING TO A MARKING SYSTEM

Peter Schrocksnadel, Etrichgasse 18a, 6020 Innsbruck, Austria

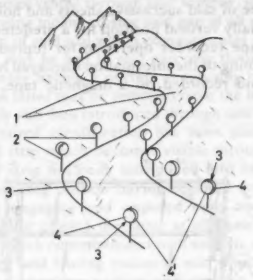
Filed May 1, 1975, Ser. No. 573,515
Int. Cl.² G09F *19/22*
U.S. Cl. 40—125 N **2 Claims**

1. A marking system for the visual identification of an area such as a ski run or the like, said system comprising:

a plurality of demarcation signs symmetrically arranged in pairs along opposite edges of a run;

each said sign having a first half of a first color and a second half of a second color, the division between said first and second halves of each sign being substantially vertical, and extending in a plane substantially parallel to the run; and

said signs of each said pair being positioned with respective similarly colored halves facing each other, whereby a



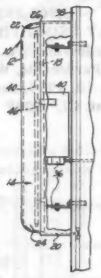
person can readily determine whether he is inside or outside the run upon viewing a single sign.

3,965,597

ADVERTISING SIGN STRUCTURE

Larry L. Noellert, Mount Clemens, Mich., assignor to Willey Sign Company, Mount Clemens, Mich.

Filed Nov. 6, 1974, Ser. No. 521,353
Int. Cl.² G09F *13/04*
U.S. Cl. 40—130 D **6 Claims**



1. An advertising sign structure comprising a single-piece shaped shell of deep drawn plastic material having front faces and side faces, said side faces having an integral continuous flange portion extending peripherally in a single plane outwardly from said side faces and an integrally formed skirt portion forming a continuous ridge with the outer end of said flange portion, a backing panel having a front surface, a rear surface and a contoured edge for fitting within said skirt portion with a marginal portion of the front surface of said panel disposed within said shell in close proximity with said continuous flange portion, a resilient gasket sandwiched between said flange portion and said front surface marginal portion, fastener means for affixing said shell to said backing panel while maintaining said gasket under compression between said flange portion and said front surface marginal portion, and support means extending between said backing panel and a supporting structure for attaching said backing panel to said supporting structure, wherein said shell skirt portion extends proximate said supporting structure and forms a protective covering for said support means and components mounted on the rear surface of said backing panel.

3,965,598
IDENTIFICATION DEVICE AND METHOD OF MAKING SAME

John R. Avery, Denver, Colo., assignor to J. J. Avery, Inc., Denver, Colo.

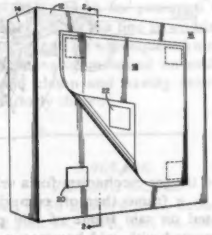
Filed Nov. 14, 1974, Ser. No. 523,657
Int. Cl.² G09F 7/00
U.S. Cl. 40—135 5 Claims

1. Sheet material comprising:
a. a sheet-like base member having stipples embossed on at least the front face thereof, said stipples being of one color,
b. said stipples being uniformly spaced and in rows disposed in quadrature, to form a display matrix on said base member,
c. an opaque coating of a different color on said face completely covering said face and the stipples thereon,
d. at least a portion of each stipple and the coating material thereover being removable to expose the remaining stipple portion of the base member of contrasting color to the opaque coating over the remaining stipples, and thereby provide desired indicia, said base member and said opaque covering are made of a material which is readily severable by a sharp instrument for removing selected stipple and the coating thereover from said material to expose the remaining portion of the stipples and the spacing between stipples being such that a selected stipple may be removed without damaging an adjacent stipple.

3,965,599
DISPLAY SYSTEM FOR INTERCHANGEABLE PRESENTATION AND STORAGE OF PICTURES

Emanuel C. Ebner, Chelmsford, Mass., assignor to Foto-Cube, Inc., Chelmsford, Mass.

Filed Oct. 10, 1974, Ser. No. 513,842
Int. Cl.² G09F 1/12
U.S. Cl. 40—152 11 Claims

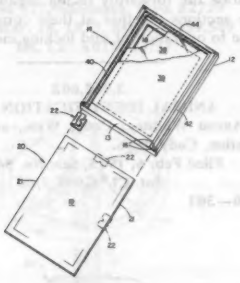


1. A display device comprising:
a background member having a display surface and a back surface;
a non-rigid two-dimensional display object;
a plurality of thin metallic keeper plates affixed in spaced relationship to the back surface of said display object;
a like plurality of magnets embedded in said display surface in a spaced configuration substantially the same as the arrangement of keeper plates on said display object; and
side members extending rearwardly from said background member to form, with said back surface, an open rearwardly facing box-like cavity of substantially the same lateral dimensions as said display object adapted for flat storage of additional display objects;
whereby said display object is removably retained on said display surface by means of mutual engagement between said magnets and said keeper plates.

3,965,600
FRAME HANGER

Wayne H. Paskerian, Winchester, Mass., assignor to M. W. Carr & Co., Inc., West Somerville, Mass.

Filed Mar. 3, 1975, Ser. No. 554,400
Int. Cl.² G09F 1/12
U.S. Cl. 40—152.1 7 Claims



1. A picture frame assembly comprising:
a frame element having inwardly facing, opposed, recesses in opposite sides thereof in a common plane;
a rigid back plate having front and rear faces with its side edges and one end edge receivable within said recesses; and
an integral hanging clip having:
a U-shaped retaining portion positioned between one of said recesses and one of said edges and retained thereby for sliding movement therealong; and
an offset hanging portion extending inwardly from said frame element and being outwardly spaced from the exterior face of said back plate for receiving an external hanging device between said clip and said back plate to support said frame assembly from a wall or the like.

3,965,601
PICTURE FRAME

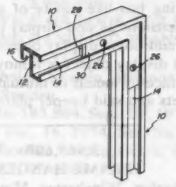
Helmar Nielsen, Townsend, Mass. 01469

Continuation of Ser. No. 422,900, Dec. 7, 1973, abandoned, which is a continuation of Ser. No. 217,915, Jan. 14, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,746
Int. Cl.² G09F 1/12
U.S. Cl. 40—155 7 Claims

1. In a picture frame formed from frame sections, each of said frame sections having a rearwardly facing channel which terminates in inwardly extending lips, having interior surfaces an improved means for securing an adjacent pair of said sections together at a corner junction comprising:
a bracket having a pair of legs disposed at an angle substantially identical to the angle made by said frame sections at said corner junction, said legs being adapted to fit within the rearwardly facing channels of adjacent frame sections at said corner junction, said legs being of a width which is greater than the rearwardly facing opening de-

fined by said lips of said rearwardly facing channels thereby to retain said bracket within said channels;

locking means for urging said bracket away from the bottom of said channels and toward and against said lips;



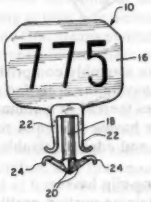
means forming the interior surfaces of said lips of said rearwardly facing channel of at least one of the frame sections to cause said at least one frame section to pivot along an axis parallel to its length and in a direction which will draw the forwardly facing regions of the adjacent frame sections together at their corner junction in response to operation of said locking means.

3,965,602

ANIMAL IDENTIFICATION TAG

Maurice Aaron Whitney, Cody, Wyo., assignor to Y-TEX Corporation, Cody, Wyo.

Filed Feb. 6, 1975, Ser. No. 547,479
Int. Cl.² G09F *3/00*
U.S. Cl. 40—301 **4 Claims**



1. An improved animal identification tag comprising: a flat information-carrying portion having a surface on which indicia may be placed; a pin extending outwardly from the edge of said information-carrying portion in a direction generally parallel to said surface; laterally extending flexible prongs on the end of said pin, at least two of said prongs being oppositely disposed and having tip portions curved downwardly away from said information-carrying portion; and a pair of flexible, resilient support members extending outwardly from said information-carrying portion adjacent to said pin, said support members being positioned to contact the surface of the ear of an animal when said prongs are passed through the ear.

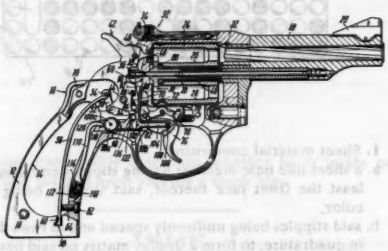
3,965,603

DOUBLE ACTION REVOLVER

Gilbert Albert Rene Maillard, Montbellard, France, assignor to Manufacture de Machines du Haut-Rhin S.A., Mulhouse Cedex, France

Filed May 9, 1974, Ser. No. 468,541
Claims priority, application France, May 9, 1973, 73.16700
Int. Cl.² F41C *19/00*
U.S. Cl. 42—65 **5 Claims**

1. In a double-action revolver comprising a frame, a hammer pivotally mounted on the frame for movement between a cocked position and a firing position, the hammer further exhibiting a safety position intermediate the cocked and firing positions, a first spring supported on the frame for urging the hammer toward its firing position, a trigger pivotally mounted on the frame, the trigger being adapted at an initial phase of its displacement from a rest position to cause the hammer to be urged toward its cocked position and thereafter, in the final phase of displacement of the trigger, to cause the release of the hammer and thus the pivoting of the hammer toward its firing position, rebounding slider means coupled to the trigger and slidably mounted in the frame, a second spring having a first end affixed to the frame and a second end engageable with the slider means for opposing the displacement of the trigger and for effecting the return of the trigger to its rest position, the slider means including a first portion for position-



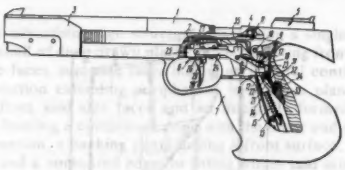
ing the hammer in the safety position when the trigger is returned to the rest position, the improvement wherein the second trigger spring is in the form of an elongated elastic arm, and in which the slider means further comprises a second portion having a contact surface resiliently engageable by the second end of the elastic arm, and means coupling the first and second portions of the slider means for varying the position of engagement between the second end of the elastic arm and the contact surface of the second portion as a function of the relative position of the slider means on the frame to maintain the restoring force component parallel to the direction of movement of the slider means on the frame relatively constant irrespective of the position of the slider means on the frame.

3,965,604

FIRING AND TRIGGER MECHANISM FOR SELF-LOADING MATCH PISTOL

Efim Leontievich Khaidurov, ulitsa Glagoleva, 25, korpus 2, kv. 138, Moscow, and Vladimir Alexandrovich Razorenov, ulitsa Ponomareva, 4-a, kv. 51, Minsk, both of U.S.S.R.

Filed Aug. 22, 1974, Ser. No. 499,847
Int. Cl.² F41C *19/00*
U.S. Cl. 42—69 B **2 Claims**



1. A firing and trigger mechanism for a self-loading match pistol mounted in a frame thereof; comprising: a hammer pivotably mounted on said frame of said pistol; a plunger operatively connected with said hammer; a firing spring received about said plunger; a bell crank pivotably mounted on said frame of said pistol; a hammer catch pivotably mounted on said frame of said pistol; said bell crank when in a cocked position of said hammer having one arm thereof engaging said hammer and having another end engaging said hammer catch; a spring having one end thereof bearing upon said bell crank and another end thereof bearing upon said hammer catch; a

trigger pivotably mounted on said frame of said pistol; a triggering rod having one end thereof operatively connected with said trigger and having another end thereof operatively connected with said hammer catch and being resiliently urged to said hammer catch by auxiliary spring means; said spring being arranged so that with said hammer in a cocked position said spring urges said bell crank to said hammer and to said hammer catch, upon disengagement of said hammer catch and said bell crank said bell crank loading said spring with an additional force compensating for the loss of the force of friction between said bell crank and said hammer catch, and disappearing at the moment of disengagement of said hammer catch and said bell crank.

3,965,605

FISH HOOK TIER

Arthur A. Allen, 1207 Martin Drive, Colorado Springs, Colo. 80915

Filed Aug. 28, 1974, Ser. No. 501,206
Int. Cl.² A01K *97/06*; B25B *1/00*
U.S. Cl. 43—1 **6 Claims**

1. A hook tying device comprising:

An elongated handle including a tubular recess in a first end

A spring clamp including gripping jaws attached to a second end of said handle and having means for pivoting one of said jaws to receive and grasp the barbed end of a fishing hook

A removable threading device having a reduced tubular end sleeved in said tubular recess, said threading device having a handle portion and a loop end portion and wherein said loop end is formed of an elastic material such that said loop end may be compressed for passing through an eye of said fishing hook for passing a line through said loop end, after which the line is withdrawn through the eye by said loop end for subsequent knotting, and a cylindrical cap removably mounted on said second end for enclosing said clamp and having mounting clip means secured exteriorly thereof.

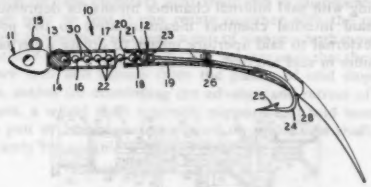
3,965,606

FISHING LURE

Donald J. Bingler, 4750 Bedford Ave., Brooklyn, N.Y. 11235

Filed Jan. 14, 1975, Ser. No. 540,857
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.16 **3 Claims**

1. An improved fishing lure including a head, said head being weighted, line attaching means on said head, said line attaching means on the top of said head, said head including a neck, a ball chain extending from said neck, a sleeve on said neck extending from said head, said sleeve surrounding at least part of said ball chain, a tail, said tail including a hook, said hook rotatably joined to said ball chain, a sleeve surrounding at least part of said hook contiguous with said head



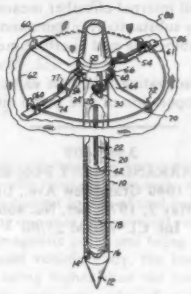
portion, said hook sleeve and said hook in a nonlinear shape adapted to rotate about said ball chain.

3,965,607

ANIMAL TRAP

Donald R. Lee, Box 577, Sundance, Wyo. 82729

Filed Mar. 18, 1975, Ser. No. 559,549
Int. Cl.² A01M *23/34*
U.S. Cl. 43—87 **15 Claims**



1. An animal trap comprising

a trigger mechanism adapted to be operated by an animal,

a noose of flexible material surrounding said trigger mechanism, and

actuating mechanism connected to said noose and controlled by said trigger mechanism operable to project said noose generally perpendicular to the plane in which it is set, to maintain said noose in open condition as it is projected, and to reduce the circumference of said noose to cause it to close in tightly about the part of the animal which operates said trigger mechanism, said trigger mechanism comprising a movable element shaped to be gripped between the jaws of the animal so that said noose closes around a head portion of the animal.

3,965,608

MANUALLY OPERATED SUCTION DEVICE FOR CAPTURING SMALL OBJECTS

Mark Schuman, 101 G. St., Southwest, Apt. 516, Washington, D.C. 20024

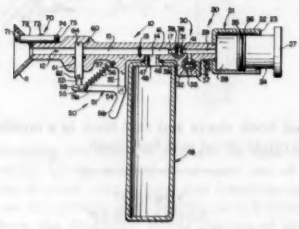
Continuation-in-part of Ser. No. 270,542, July 10, 1972, abandoned. This application May 1, 1974, Ser. No. 466,063
Int. Cl.² A01M *3/00*
U.S. Cl. 43—110 **62 Claims**

1. A manually operated, manually powered portable device for capturing small objects in the form of a hand held unit, said unit comprising:

a housing including an internal chamber means for vacuum storage;

aperture means in said housing for connecting said internal chamber means with the atmosphere;

pump means being a portion of said unit and communicating with said internal chamber means for depressurizing said internal chamber means relative to the pressure external to said aperture means to create a partial vacuum in said internal chamber means;



first valve means in said aperture means for blocking said aperture means during said depressurization and for substantially instantaneously substantially equalizing the pressure in said internal chamber means with said external pressure by substantially instantaneously subs'antially completely unblocking said aperture means when manually activated;

and means for activating said first valve means independently of the operation of said pump means.

3,965,609

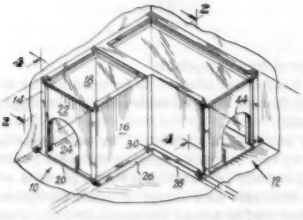
BAITING ARRANGEMENT FOR RODENTS

Carmel T. Jordan, 1040 Grandview Ave., Union, N.J. 07083

Filed May 2, 1974, Ser. No. 466,149

Int. Cl.² A01M *25/00*

U.S. Cl. 43—131 **5 Claims**



1. A bait feeding arrangement for rodents comprising, in combination, a first modular housing of assembled permanently rigid elements having an entrance wall with an entrance opening for admitting a rodent; a second modular housing of assembled permanently rigid elements connected to said first modular housing and having an exit wall with an exit opening through which said rodent may leave; interlocking connecting means on said first and second housings for connecting said housings; passage means connecting said entrance opening and said exit opening, said rodent being confined to move along said passage means in traveling from said entrance opening to said exit opening, said housings being located along a wall surface; and poison feed means within said first and second modular housings and containing feed for said rodent, said feed means extending substantially along said passage means connecting said entrance opening and said exit opening, said feed means extending along one side of said passage means and in substantially close proximity thereof; said feed means being spaced from said entrance opening and said exit opening to be inacessible from said openings, said feed means being accessible to said rodent only after said rodent has entered substantially the interior of said passage means, said interlocking connecting means comprising a plurality of pegs on one of said housings, and a plurality of openings on the other one of said housings, said pegs being inserted into said openings for interlocking said housings to each other; a plurality of rail members at the bottom of said one housing for supporting said pegs, said pegs being formed on a lip-shaped portion on said rails of said one housing; and a plurality of auxiliary rails on the other one of said housings at the bottom thereof for containing said openings, said openings being arranged within lip-shaped portions in said rails at the bottom of said other one of said housings, said lip portions of said first and second modular housings overlapping when said pegs are inserted into said openings; a transparent plate-shaped member at the top of said first and second modular housings, said first and second modular housings having slots at the top portions of said housings for retaining said transparent plate-shaped member, said transparent plate-shaped member being removable from said housings by sliding out of said slots; and a dividing wall within each of said housings for separating said feed means from the passage along which said rodent passes through said housings.

3,965,610

CONSTRUCTION UNITS, SOME WITH CORRESPONDING PINION WHEELS MOUNTED IN MESHED RELATION

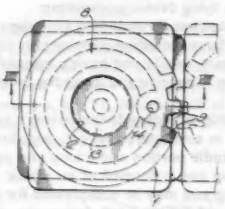
Alfons Adriaan Den Ouden, Antwerp, Belgium, assignor to Brabo Corporation Naamloze Vennootschap, Antwerp, Belgium

Filed Aug. 5, 1974, Ser. No. 494,867

Claims priority, application United Kingdom, Sept. 7, 1973, 42209/73

Int. Cl.² A63H *33/04*

U.S. Cl. 46—17 **9 Claims**



1. A toy kit for exercising the creative ability of children comprising a plurality of individual units, each of said units having upper and lower faces and carrying cooperative integral means laterally of said faces for directly interlockingly uniting the same together with said upper faces in side by side relation in a desired pattern so as to create a flat generally horizontally disposed base, a plurality of pinion wheels, at least two of said pinion wheels and two of said upper faces of said individual units having mutually cooperable means for rotatably mounting a maximum of one said pinion wheel per individual unit, and said at least two pinion wheels and said two individual units being so constructed, arranged and dimensioned that said at least two pinion wheels are in meashed relationship when said at least two individual units are united by said integral uniting means.

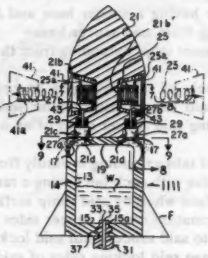
3,965,611
DIRECTIONALLY STABLE REACTION-FLUID-PROPELLED CARRIER MISSILE WITH FLUID-SEALED MOVABLE RETENTION AND RELEASE WALL

Reginald F. Pippin, Jr., 7806 Ruxway Road, Towson, Md. 21204

Division of Ser. No. 228,279, Feb. 22, 1972, which is a division of Ser. No. 36,120, May 11, 1970, Pat. No. 3,646,702, which is a continuation-in-part of Ser. No. 504,299, Oct. 24, 1965, Pat. No. 3,510,980. This application Apr. 16, 1974, Ser. No. 461,367

Int. Cl.² A63H *27/00, 33/20*

U.S. Cl. 46—74 B **25 Claims**



1. A propelled toy arrangement comprising

a self-propelled carrier unit including a generally rigid body having a pressurizable fluid chamber and a fluid discharge orifice in fluid connection between said chamber and the outside atmosphere and being fixed in directional orientation during fluid discharge therethrough,

said self-propelled unit having a fluid-sealed fluid-pressure-responsively movable retention-and-release wall in fluid connection with and movable in response to pressure in said chamber, and adapted to releasably hold and carry a carryable unit or member in a first releasably retained condition relative to and by said carrier unit as a function of the retentive positioning of said movable retention-and-release wall in response to internal fluid pressure in said body chamber, and for release of a said carryable unit or member from said first retained condition as a function of movement of said wall to a retracted release position upon decrease of fluid pressure in said chamber.

3,965,612
DRIVING MECHANISM FOR TRAVELING TOY

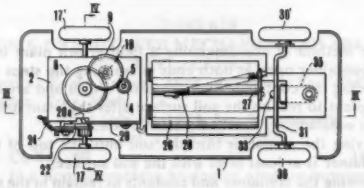
Seiji Asano, Tokyo, Japan, assignor to Shimsei Kogyo Co., Ltd., Japan

Filed Nov. 18, 1974, Ser. No. 524,862

Claims priority, application Japan, Nov. 21, 1973, 48-134353[U]

Int. Cl.² A63H *17/40*

U.S. Cl. 46—211 **8 Claims**



1. A driving mechanism for a travelling toy, comprising drive motor means having a rotatable shaft, a sun gear fixed to said rotatable shaft for rotation therewith, a rotary member freely rotatably mounted around said shaft, a pair of stopping pieces provided on said rotary member in staggered locations with a phase difference of substantially 180°, a planetary gear shaft on said rotary member, a planetary gear rotatably mounted on said planetary gear shaft and in alignment with the sun gear so that it can rotate together with the rotary member around said sun gear, a pair of stoppers both mounted on one side wall of said housing in a manner such that they can advance into and retreat from the passes of said stopping pieces, means for controlling the advance and retreat of said stoppers, a wheel shaft rotatably supported at said housing, and a pair of crown gears mounted on said wheel shaft and alternately engageable with said planetary gear.

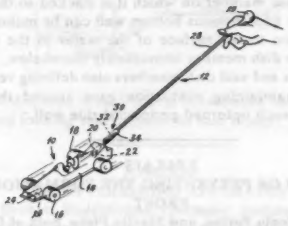
3,965,613
MAGNETIC TOY

Jack L. Saunders, S.C. Rte. Box 78, West Plains, Mo. 65775

Filed Feb. 12, 1975, Ser. No. 549,373

Int. Cl.² A63H *33/26*

U.S. Cl. 46—238 **7 Claims**



1. A magnetically operated toy comprising a wheeled vehicle having a body with front and rear ends, magnetic means on the vehicle body adjacent to one of said body ends, said magnetic means having opposite end portions respectively forming north and south magnetic poles and being fixedly positioned with respect to said vehicle body, the lowest point of said magnetic means being higher than the lowest point of said vehicle, one of the magnetic poles of said magnetic means being oriented essentially forwardly of the other magnetic pole on said vehicle body, and means to manipulate the vehicle by moving it over a surface including a rod-shaped operator member having a first end portion to be held by the operator and an opposite end portion having magnetic means associated therewith for cooperating magnetically with a magnetic means on the vehicle so that when the magnetic means on the rod and the magnetic means on the vehicle cooperate and the rod is moved the vehicle will move on the surface on which it is positioned, the magnetic means associated with the vehicle being further oriented such that when the vehicle is in operative position on a surface the axis of said magnetic means intersects a horizontal plane at an elevational angle.

3,965,614
APPARATUS FOR SPROUTING SEEDS

Karl E. Kienholz, 4400 Loch Alpine Drive, W., Ann Arbor, Mich. 48103

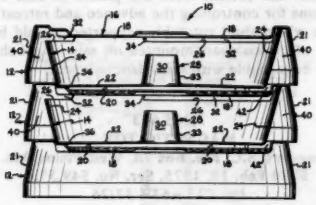
Filed Nov. 28, 1975, Ser. No. 635,969

Int. Cl.² A01C *1/02*

U.S. Cl. 47—14 **11 Claims**

1. Germinating apparatus for sprouting seeds, legumes, grains or the like comprising a plurality of base members and a plurality of dish members adapted to be stacked alternately in a vertical arrangement with base members being the bottom and top members of the arrangement, said base members having similar configurations, each base member having an imperforate top wall with a recessed portion for retaining a surface of water thereon and a downturned peripheral side wall flaring outwardly from and terminating below said top wall, said dish members also having similar configurations,

each dish member having a foraminous bottom wall on which beans or the like can be dispersed, and an upturned peripheral side wall flaring outwardly from and terminating above said bottom wall, said base members and said dish members defining support means for maintaining the bottom wall of each dish member a preselected distance above the recessed portion of the base member on which it is stacked so that beans or the like on a foraminous bottom wall can be maintained in spaced relation to the surface of the water in the recessed portion of the dish member immediately therebelow, and said base members and said dish members also defining ventilation means for maintaining ventilation gaps around the upper periphery of each upturned peripheral side wall.



3,965,615

METHOD OF PREVENTING THE FORMATION OF FROST

Abelardo Antonio Portas, and Martin Pinto, both of Chivilcoy 140, Buenos Aires, Argentina

Filed Sept. 30, 1974, Ser. No. 510,581

Claims priority, application Argentina, Oct. 16, 1973, 250541

Int. Cl.² A01G *13/00*; C09K *3/30*

U.S. Cl. 47—2 **18 Claims**

1. A method for producing a fog to absorb moisture from plants and increase the ambient humidity surrounding the plants to prevent frost damage comprising the steps of providing in relatively sufficient amounts, silicon tetrachloride, an emulsifier, and ammonia, and forcibly combining said silicon tetrachloride, emulsifier and ammonia, said silicon tetrachloride and said ammonia and said emulsifier combining to form an atmospheric fog containing ammonium chloride and silicone dioxide and emulsifier to absorb moisture from plants and raise the ambient humidity surrounding the plants, to thereby aid in avoiding the rupture of the cells of said plants as a result of the freezing of said moisture in said cells.

3,965,616

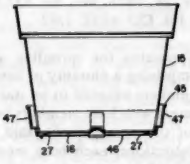
LOCKABLE VEGETATION POT AND SAUCER

John C. Ridgeway, 4216 Brookway Lane, Brooklyn, Ohio 44144

Filed Dec. 30, 1974, Ser. No. 537,242

Int. Cl.² A01G *9/02*

U.S. Cl. 47—34 R **5 Claims**



1. A lockable vegetation pot and saucer, comprising in combination:

a plastic pot having a pot base with a drain aperture therein and integral pot sides diverging from said pot base;

a plurality of pot legs extending from said pot base at a spaced distance from the other perimeter of said pot base;

a plurality of pot stops extending from the inside surface of said pot sides a distance less than said spaced distance of said pot legs;

whereby the angle of said diverging pot sides enables stacking of said pot with similar pots with said pot base engaging said pot stops of an adjacent similar pot;

a plurality of locking apertures in said pot sides each aperture having a locking side adjacent said pot base with said plurality of locking apertures in said sides being respectively adjacent said plurality of pot legs depending from said pot base;

a plastic saucer having a saucer base and integral saucer sides diverging from said saucer base;

a plurality of saucer stops extending from the inside of said saucer;

whereby the angle of said diverging saucer sides enables stacking of said saucer with similar saucers with said saucer engaging said saucer stops of an adjacent similar saucer;

and a plurality of tabs extending inwardly from the inside of said saucer sides with each tab having a ramp surface and a locking surface whereby said ramp surface causes progressive deformation of said saucer sides upon insertion of said pot into said saucer until said locking surfaces of said tabs engage said locking sides of said locking apertures to resiliently hold said pot legs against said saucer base.

3,965,617

METHOD OF POTTING TREES AND SHRUBS

Makoto Kawase, 902 Ridgecrest Drive, Wooster, Ohio 44691

Filed Apr. 11, 1975, Ser. No. 567,055

Int. Cl.² A01G *23/02*

U.S. Cl. 47—58 **10 Claims**

1. The method of containerizing a field grown plant in a tubular container open at both ends comprising the steps of:

A. Placing the container over the plant crown and around the plant to rest on the soil surface after the plant has at least substantially reached a salable size,

B. Driving the container into the soil until the top of the container is at least level with the soil surface,

C. Allowing the container and contents to remain in the soil approximately from 4 to 12 months,

D. Removing the container and its contents from the soil,

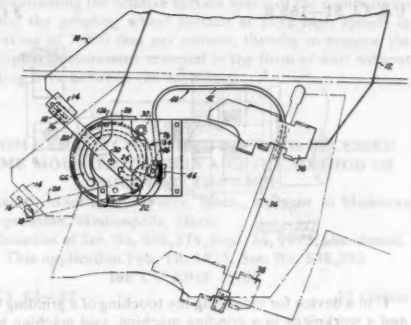
E. Placing the container and its contents in an outer container which has a bottom and is slightly larger than said first container.

3,965,618

PROGRAMMED SEQUENTIAL OPERATOR

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detriot, Mich.

Filed Mar. 1, 1974, Ser. No. 447,158
Int. Cl.² E05F 5/12
U.S. Cl. 49—103 14 Claims



1. A programmed sequential operator comprising an actuator reversely rotatable between limiting positions, first and second operating members each independently reversely movable between limiting positions, connections between said actuator and said operating members effective to produce forward and reverse movements of said members in sequentially programmed relation to forward and reverse movement of said actuator, one of said members being a rotatable driven member, said connections comprising drive means operable to rotate said driven member during a part of the rotary movement of said actuator, and blocking means acting between said actuator and rotatable driven member to block said rotatable driven member against rotation during another part of the rotary movement of said actuator while providing for continued rotation of said actuator, said actuator having peripheral gear teeth and an edge portion in which teeth are omitted to form a gap, said rotatable driven member being in the form of a pinion adapted to mesh with the peripheral teeth of said actuator, a blocking cam connected to said actuator having a circumferentially extending arcuate convex surface at one side of the plane occupied by its teeth and located generally at said gap and concentric with the axis of rotation of said actuator, said pinion having a concave radially facing surface at one side of the plane of its teeth and in the plane of the arcuate convex surface of said blocking cam, said concave surface being conformed to the arcuate convex surface of said blocking cam to provide for continued rotation of said actuator while said pinion is blocked against rotation.

3,965,619

QUICK CHANGE FEED MECHANISM AND ABRASIVE REPLACEMENT

Robert C. Engle, Holland, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

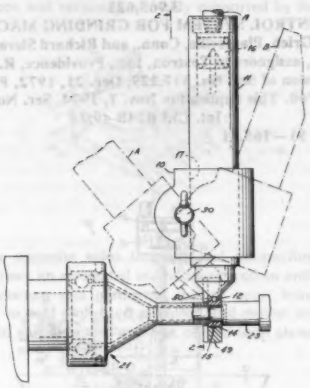
Filed July 31, 1975, Ser. No. 600,698
Int. Cl.² B24B 49/00
U.S. Cl. 51—58 10 Claims

1. In a honing machine having an abrasive mounted on an oscillating bridge wherein the apparatus for affixing said abrasive to said bridge comprises:

a. feed cylinder having an internal feed means wherein said abrasive is housed;

b. said bridge having a bore wherein said feed cylinder projects therethrough;

c. a lateral groove in said cylinder aligned with a lateral bore in said bridge; and



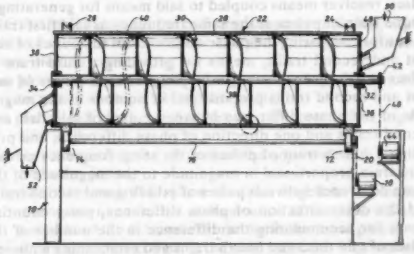
d. a pin disposed in said lateral bore means and said groove means locking said cylinder in said bridge.

3,965,620

DRUM POLISHING APPARATUS

Manfrid Dreher, Engelsbrand, Germany, assignor to Dr.-Ing. Manfrid Dreher KG apparatebau und chemisch Verfahrenstechnik fur Oberflachenbehandlung von Metallen, Engelsbrand, Germany

Filed Aug. 8, 1974, Ser. No. 495,640
Claims priority, application Germany, Aug. 16, 1973, 2341268
Int. Cl.² B24B 31/02
U.S. Cl. 51—164 15 Claims



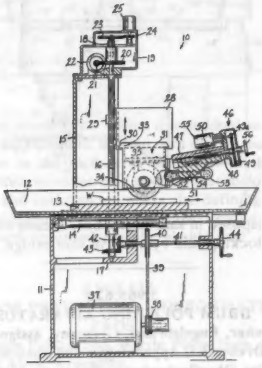
1. Drum apparatus for the mechanical surface treatment of particulate material by a suitable media comrpising a cylindrical casing adapted to be rotated about its central axis, an inlet at one end for the supply of media and material and an outlet at the other end for the removal of said media and material, a screw conveyor located within said casing adapted to be rotated relative to said casing to move said media and material, said screw conveyor extending substantially the length of said casing and radially outward into proximity with the surface of the inner wall of said casing and comprising an axle and a spiral blade integrally formed therewith, said axle being journalled in bearings located at each end of said casing comprising a central hub surrounding said axle and support means extending radially outward in connection with said casing, said support means having an opening therein adapted to align with said inlet and outlet means on rotation of said casing, and means for variably rotating each of said casing and screw

conveyor independently of the other, to obtain selectively variable relative speed therebetween.

3,965,621
CONTROL SYSTEM FOR GRINDING MACHINE

Paul E. Grieb, Plantsville, Conn., and Richard Sieradzki, Troy, Mich., assignors to Textron, Inc., Providence, R.I.

Division of Ser. No. 317,229, Dec. 21, 1972, Pat. No. 3,859,760. This application Nov. 7, 1974, Ser. No. 521,630
Int. Cl.² B24B *49/18*
U.S. Cl. 51—165.71 **5 Claims**

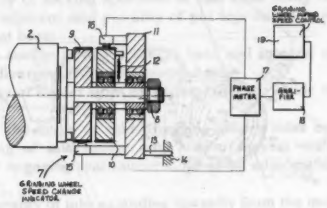


1. A surface grinder comprising a wheelhead arranged to drive a grinding wheel, means defining a reference plane, means including a pulse responsive motor for moving said wheelhead and wheel in elevation above the reference plane, a source of motor drive pulses, means providing a first train of pulses, resolver means coupled to said means for generating a second train of pulses at the same frequency as said first train, means for comparing the phase difference of the pulses of said first and second trains, means for providing a third train of pulses at a frequency substantially higher than pulses of said first and second trains proportional in number to the magnitude of the phase difference between pulses of said first and second trains and one direction of phase difference, and providing a fourth train of pulses of the same frequency as said third train proportional in magnitude to the magnitude of the phase difference between pulses of said first and second trains and the other direction of phase difference, pulse counting means for accumulating the difference in the number of the pulses of said third and fourth trains and establishing a numerical representation thereof, each of the pulses of said third and fourth trains representing an increment of distance between the cutting surface of said wheel and said reference plane, means for visually displaying the distance represented in said counting means, a grinding wheel dresser adapted to be moved into contact with said grinding wheel and reduce the radius thereof, a second pulse responsive motor adapted to move said dresser into contact with said grinding wheel, means for applying motor drive pulses to said second motor, means for selecting a predetermined dressing dimension for said wheel and storing said dimension, dresser pulse counting means adapted to count pulses applied from said pulse source to said second motor and permit application of a number of pulses representative of a preselected dressing dimension to said second motor, and means responsive to application of drive pulses to said second motor for applying a number of pulses of one of said third and fourth pulse trains to said pulse counting means to modify the difference therein in accordance with the dressing dimension.

3,965,622
DEVICE FOR INDICATING THE TOUCHING OF A GRINDING WHEEL AND A WORKPIECE

Karel Stepanek, Prague, Czechoslovakia, assignor to Vyzkumny ustav obrabecich stroju a obrabeni, Prague, Czechoslovakia

Filed Jan. 20, 1975, Ser. No. 542,452
Claims priority, application Czechoslovakia, Jan. 21, 1974, 375-74
Int. Cl.² B24B *49/00*
U.S. Cl. 51—165 R **3 Claims**

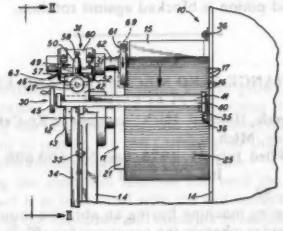


1. In a device for indicating the touching of a grinding wheel and a workpiece in a grinding machine, said machine having a spindle to which a grinding wheel is affixed, said device comprising, in combination, a shaft connected to the spindle, a first magnetic gear wheel affixed to the shaft, a second identical magnetic gear wheel rotatably mounted on the shaft, the second gear wheel normally rotating in phase with the first gear wheel, a spring extending between the second gear wheel and the shaft for effecting a retardation in phase of the rotation of the second gear wheel with respect to the first gear wheel upon the touching of the grinding wheel and the workpiece, a pair of magnetic heads individually fixedly disposed in magnetic association with the peripheries of the first and second gear wheels for generating a pair of signals differing in phase in proportion to the retardation in phase of the second gear wheel relative to the first gear wheel, and a phase meter coupled to the outputs of the respective magnetic heads.

3,965,623
METHOD FOR TRUEING COMMUTATORS AND SLIP RINGS

Thaddeus Robert Grutza, 2160 Stirling Road c/o Deerfield P.O., Bannockburn, Ill. 60015, and Kenneth Edward Grutza, 3246 Robincrest Drive, Northbrook, Ill. 60062

Continuation-in-part of Ser. No. 533,121, Dec. 16, 1974, abandoned. This application July 7, 1975, Ser. No. 593,590
Int. Cl.² B24B *1/00, 5/50*
U.S. Cl. 51—281 R **3 Claims**



1. The method of in-place trueing of a segmented copper commutator with a traversing grinding wheel which includes the improved steps of:

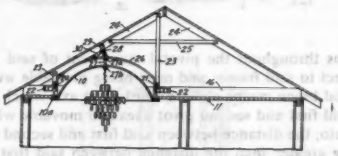
1. rotatably driving the commutator to be trued in its own journal support so that the commutator surface is in its normal running position;
2. simultaneously rotatably driving a peripheral grinding wheel surface exhibiting a grit size in the order of from about 150 to 180 at a peripheral speed of substantially at least 7,000 feet per minute;
3. contacting at least ½ to ¾ inch of said peripheral surface against the commutator surface with forces in the order of from about 2 to 3 pounds; and
4. maintaining the relative surface speed of the commutator and the grinding wheel surface at ultra high speeds in excess of 7,000 feet per minute, thereby to remove the copper commutator material in the form of dust without drag over between the segments.

3,965,624

ROOM CEILING CONSTRUCTION WITH RECESSED DOME MOUNTED THEREIN AND THE METHOD OF MOUNTING THE SAME

Thomas P. Madonna, Navarre, Minn., assignor to Madonna Corporation, Minneapolis, Minn.

Continuation of Ser. No. 400,379, Sept. 24, 1973, abandoned. This application Feb. 10, 1975, Ser. No. 548,392
Int. Cl.² E04F *19/00*
U.S. Cl. 52—28 **12 Claims**



5. A room ceiling structure in a building and including a finished ceiling

a plurality of structural joist members supporting said ceiling and a concave dome mounted in said ceiling in a building for suspending a chandelier type hanging fixture and comprising

an integrally formed pre-fabricated concave open bottom dome unit adapted to be installed in a ceiling opening of a size substantially greater than the space between more than two joist members and formed in the ceiling of a building, and having a peripheral flange integrally formed around the lower edge thereof and extending radially outwardly from said lower edge,

means supporting the dome unit from the ceiling structure of the building with the flange thereof attached to said ceiling and engaging the surface thereof.

3,965,625

CANOPY SUPPORT TOWERS WITH ADJUSTABLE CANOPY

Stevan C. White, Des Moines, Iowa, assignor to Music Circuit Productions, Inc., Des Moines, Iowa

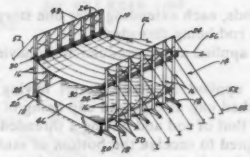
Filed Apr. 2, 1975, Ser. No. 564,304
Int. Cl.² B66B *9/00*
U.S. Cl. 52—29 **7 Claims**

1. In combination,

a flexible canopy having opposite ends and opposite sides, said canopy having a plurality of spaced-apart loop elements secured thereto adjacent the opposite sides thereof,

a plurality of spaced-apart and vertically disposed towers positioned at each of the opposite sides of said canopy,

each of said towers having a platform means selectively vertically movably mounted thereon, means connected to said platform means for selectively raising and lowering said platform means relative to said tower and connection means operatively secured to and extending between said platform means and adjacent towers at one side of said canopy for connection to said loop elements at said one side of said canopy whereby said canopy may be extended between and vertically movably supported by the towers



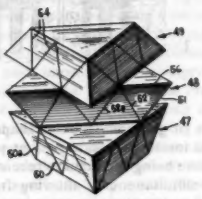
at the opposite sides thereof; said connection means comprises an elongated member secured to and extending between said platforms, spaced apart brackets secured to said elongated member, and means secured to each of said brackets and one of said loop elements.

3,965,626

BUILDING MODULE

Mark B. Johnson, P.O. Box 1578, Santa Cruz, Calif. 95061

Filed Nov. 21, 1974, Ser. No. 525,994
Int. Cl.² E04H *3/00*
U.S. Cl. 52—79 **3 Claims**



1. A space structure for building purposes including a plurality of space modules stacked one above the other with each space module comprising:

a plurality of beams joined together to form a truncated tetrahedral shape having side walls;

a plurality of ribs extending between the beams forming the side walls;

means connecting the rib ends to the adjacent beam to form rib-beam joints;

means fastening the space modules together in stacked arrangement such that at least some of the side walls on one side of the structure do not lie in the same plane, and sheeting means covering the side walls and exposed surfaces of the modules thereby to form an enclosed multi-level space structure.

3,965,627

INTERCONNECTION OF MODULAR STRUCTURES

Miroslav Fencl, 59-28 57th Drive, Flushing, N.Y. 11378

Continuation-in-part of Ser. No. 485,462, July 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 294,391, Oct. 12, 1972, abandoned, which is a continuation-in-part of Ser. No. 289,935, Sept. 18, 1972, abandoned, which is a continuation-in-part of Ser. No. 143,547, May 14, 1971, abandoned. This application May 9, 1975, Ser. No. 576,220
Int. Cl.² E04H *9/06*
U.S. Cl. 52—79 **3 Claims**

1. An interconnection of a structure comprizing a modular assembly and a substructure supporting said assembly at its base; said assembly consisting of several stories and composed

of a plurality of self-supporting modules each having the form of a rectangular tube defined by two walls, a floor-slab and a ceiling-slab; said assembly being put together in a "wall beside wall, frontend to back-end, floor-slab over ceiling-slab" fashion;

a. said structure being interconnected vertically and laterally:

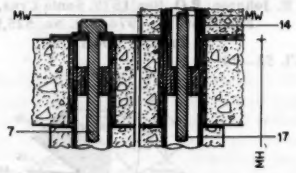
1. by rods, each extending over one story, the bottom of each rod being threaded;

rods applied at top modular story having a nut head at top;

rods applied at other stories having an immovably attached cap at top, said cap being of larger diameter than that of rod and having a threaded aperture at top designed to receive the bottom of said rods, said caps when installed projecting above the top of the modular story;

2. by pegs of generally identical shape with said rod cap, one such peg or a group of several pegs being immovably attached to a plate and such a subassembly being anchored at the top of the substructure so that pegs project above the substructure;

3. by pipes in which said rods or said pegs are encased, said pipes being embedded in walls of modules along the modular height;



a fixture of generally tubular shape being immovably attached inside each said pipe at top, the aperture of said fixture being threaded to receive bolts of the lifting device, simultaneously allowing free passage of said rods;

4. by connecting plates penetrated by several holes of which the number corresponds with the number of pipes at that particular joint, the hole diameter corresponding to the size of the said rod caps or pegs;

b. the interconnection of the hardware being accomplished so that:

rods applied at the first modular story are connected by screwing with said pegs and rods of intermediate stories are connected by screwing with one another, in either case the bottom of the rod cap resting on the top of the fixture;

rods applied at the top modular story being connected by screwing with rod caps below, the nut head of these rods resting on top of the plate applied over said pipes of the top modular story;

connecting plates applied between ceiling-slabs and floor-slabs being engaged by holes with projecting rod caps, connecting plates applied on top of the top modular story being engaged by holes with rods of the top story.

3,965,628

DRILL MAST SUPPORT ASSEMBLY

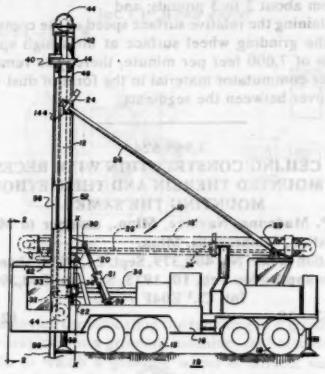
James B. Loftis, Remlap, Ala., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 458,331, April 5, 1974, abandoned. This application Mar. 26, 1975, Ser. No. 562,175

Int. Cl.² E04H *12/34;* **E21C** *11/02*

U.S. Cl. 52—115 **10 Claims**

1. A drill mast support assembly comprising: an elongated frame, an elongated drill mast connected to said frame adjacent one end portion of said mast for selective pivotal movement about a first pivot axis between a drilling position and a non-drilling position; elongated rigid brace means supported adjacent one end by said frame and pivotable with respect thereto about a second pivot axis which is parallel to said first pivot axis; support means on said mast connecting said brace means and said mast adjacent the end portion of said mast opposite said on end portion to permit relative longitudinal and pivotal movement of said mast with respect to said brace



means throughout the pivotal movement of said mast with respect to said frame; said mast being pivotable with respect to said brace means about a third pivot axis which is parallel to said first and second pivot axes and movable with respect thereto; the distance between said first and second pivot axes being greater than the distance between said first and third pivot axes; and the longitudinal axes of said frame, said mast and said brace means being generally parallel to each other when said mast is in said non-drilling position.

3,965,629

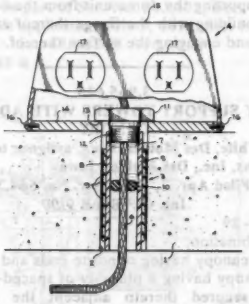
CONDUIT APPARATUS

James R. Pearson, Houston, Tex., assignor to Lawrence A. Bresan and James R. Pearson, both of Houston, Tex., a part interest to each

Filed Sept. 11, 1974, Ser. No. 505,043

Int. Cl.² E04B *5/48, 1/38*

U.S. Cl. 52—221 **8 Claims**



1. Conduit apparatus providing a fire resistant passageway, or an elongate member, through a hole in a barrier such as a floor, wall or the like comprising:

tubular core means through the interior of which said elongate member may pass;

friction means surrounding the exterior of said core means for frictional and sealing engagement with said hole through said barrier, said friction means comprising radial projections, substantially surrounding said core for an interference fit with said hole and having surfaces facing in one direction, relative to the axis of said hole, which are tapered for less frictional resistance to longitudinal movement in said one direction than the frictional resistance created to longitudinal movement in the opposite direction by the surfaces of said radial projections facing in the opposite direction so that said apparatus may be inserted into said hole in said one direction with substantially less force than necessary to remove said apparatus in said opposite direction; and

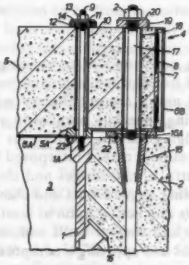
seal means engageable with said interior of said core means and the exterior of said elongate member.

3,965,630

PRESTRESSED CONCRETE BOILER CLOSURE

Anthony Charles Roberts, Leicester, England, assignor to Taylor Woodrow Construction, Limited, Southall, England

Filed Nov. 19, 1974, Ser. No. 525,114
Int. Cl.² E04C *3/22, 5/08*
U.S. Cl. 52—224 **7 Claims**



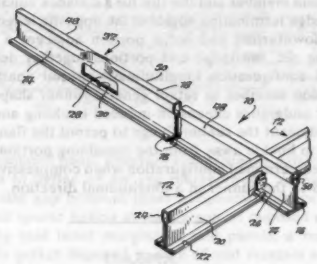
1. A vessel comprising a prestressed concrete container; prestressing members anchored in the material of said container to apply prestress thereto; a chamber in said container; a removable closure member also formed of concrete for said chamber; primary and secondary hold-down means for holding said closure member in its closed position; said primary hold-down means including releasable members held fast with the material of said container to hold down said closure member; said secondary hold-down means including members which pass through said closure member; retaining means mounted on said secondary hold-down means for securing said members of the secondary hold-down means relative to said closure member; and releasable couplings for coupling respective members of said secondary hold-down means to corresponding prestressing members; whereby said members of the secondary hold-down means, in holding down said closure member, serve to extend said corresponding prestressing members, which latter continue to apply the prestress to said container when said members of the primary and the secondary hold-down means are released to permit removal of said closure member.

3,965,631

FIRE RATED GRID-MEMBER WITH CONTROLLED EXPANSION MEANS

Gale E. Sauer, Williamsville, N.Y., assignor to Roblin Hope's Industries, Inc., Buffalo, N.Y.

Filed Aug. 1, 1974, Ser. No. 493,551
Int. Cl.² E04B *1/68*
U.S. Cl. 52—232 **9 Claims**



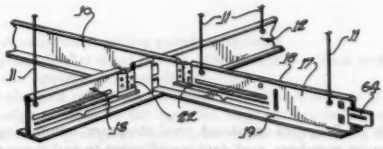
1. An improved grid member for supporting grid systems and the like, said grid member having a web means, load carrying flange means extending laterally outwardly of said web means, and a bead means having opposed sidewall portions surmounting said web means and being longitudinally aligned therewith for providing increased rigidity to said grid member, and said web means including a cut-out portion in a disposition intermediate to said load carrying flange means and said bead means for absorbing longitudinal compression therein, wherein said improvement comprises: said bead means being normally hollow in transverse cross-section and having at least one deformed portion along the longitudinal length thereof, said deformed portion having correspondingly opposed sidewall portions of said bead means formed into substantially planar abutment with one another so that said deformed portion is substantially non-hollow in transverse cross section, and said plane of abutment so formed between said deformed sidewall portions being slightly oblique to the longitudinal axis of said bead means so that during longitudinal compression of said bead means, said plane of abutment folds in a longitudinal direction to absorb such longitudinal compression.

3,965,632

FIRE RATED GRID

Donald L. Rousey, Des Plaines, Ill., assignor to Questor Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 490,065, July 19, 1974, abandoned. This application July 23, 1975, Ser. No. 598,207
Int. Cl.² E04C *2/42*; E04B *1/98*
U.S. Cl. 52—232 **18 Claims**



1. A longitudinally extending runner for a fire-rated ceiling suspension system comprising a web, an interrupted bead along one web margin, a flange along the other web margin, a buckleable web expansion member substantially longitudinally coextensive with the bead interruption which is adapted

to deform into a diamond-shaped pattern extending away from both sides of the web when compressive forces are applied to the runner in a longitudinal direction, the web being partially divided by a longitudinally oriented slot extending substantially in one direction only from and under said web expansion member for a limited distance, a portion of the web adjacent the slot and between the slot and the flange partially defining two opposed, longitudinally offset L-shaped lipped ledges, together extending beneath the web interruption, the expansion member and the slot for a distance equal to the slot, each ledge terminating adjacent the opposite ledge in a diagonally downturned end ledge portion adjacent a ledge end-defining slit, the ledge end portions together defining a V-shaped configuration longitudinally spaced apart from said expansion member to retain general runner shape when the runner undergoes expansion-induced buckling and having its apex adjacent the runner flange to permit the flange and web ledges to buckle away from the remaining portion of the web in a predetermined configuration when compressive forces are applied to the runner in a longitudinal direction.

3,965,633

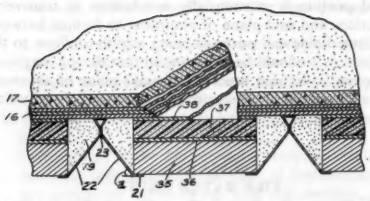
INSULATED ROOFING STRUCTURE AND METHOD

Frank E. Carroll, Barrington, Ill., assignor to Decks, Incorporated, Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 457,996, April 4, 1974. This application July 8, 1974, Ser. No. 486,444

Int. Cl.² E04B *1/24*; E04C *2/10*

U.S. Cl. 52—309 **6 Claims**



1. A fireproof insulated roof structure comprising: roof support members, roof decking adjacent to and supported by said roof support members, incombustible rigid gypsum formboard above and adjacent to said roof decking, synthetic polymer foam above and adjacent to said formboard, and a waterproof wearing surface to the exterior of said foam, wherein the lower surface of said gypsum formboard is bonded to the upper surface of a precast wood fiber cement-bonded board roof decking.

3,965,634

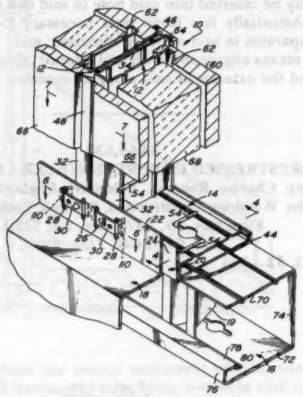
MODULAR BUILDING

Wesley T. Murphy, Auburn, N.Y., assignor to Vercon Products, Inc., Charlotte, N.C.

Continuation of Ser. No. 160,018, July 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 85,533, Oct. 30, 1970, abandoned. This application Oct. 26, 1973, Ser. No. 410,076

Int. Cl.² E04B *1/68*

U.S. Cl. 52—403 **2 Claims**



1. A building construction comprising at least one stud member secured to a surface, said stud member comprising a first longer wall and a second shorter wall, said longer and shorter walls being generally parallel to each other and connected by a bridging section, said longer wall being adjacent to said surface, resilient means interposed between said longer wall and said surface, said longer and shorter walls and said surface each having aligned slots and clamp means extending through said slots and acting upon at least said shorter wall to urge said longer and shorter walls and said surface inwardly toward each other and applying a compressive force upon said resilient means.

3,965,635

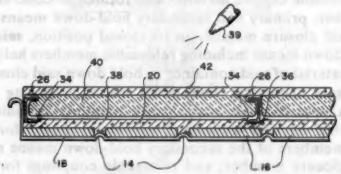
PREFABRICATED BUILDING PANEL AND METHOD OF MAKING

John S. Renkert, Canton, Ohio, assignor to Metropolitan Industries, Inc., Canton, Ohio

Filed Apr. 17, 1975, Ser. No. 569,276

Int. Cl.² E04B *2/00*, *1/00*

U.S. Cl. 52—434 **10 Claims**



1. A process for forming an insulated concrete panel comprising,

providing a mold cavity with said cavity having a surface of cementitious material,

depositing a resinous mixture in said cavity in contact with said cementitious surface,

foaming the resinous mixture to fill the cavity,

applying a layer of cementitious material over the resinous mixture and in contact with said surface of cementitious material to completely enclose the foam within the cementitious mold cavity.

3,965,636

PANELING FOR WALLS OR THE LIKE

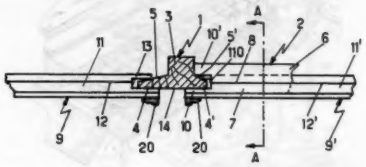
Eugen Huber, Echbeck, Germany

Filed Feb. 3, 1975, Ser. No. 546,822

Claims priority, application Switzerland, Feb. 1, 1974, 1393/74

Int. Cl.² E04B 5/52

U.S. Cl. 52—496 **13 Claims**



1. A decorative and/or protective paneling for walls, ceilings or the like, comprising a skeleton frame including at least one elongated first frame member having two longitudinally extending marginal portions and at least one longitudinally extending tongue which includes one of said marginal portions and tapers in a direction away from the other of said marginal portions, and at least two spaced-apart elongated second frame members having bifurcated end portions into which said tongue extends, each of said end portions having a pair of prongs frictionally engaging said tongue in wedging relationship at the opposite sides thereof; and a panel disposed between and supported by said second frame members.

3,965,637

COMPOSITE BLOCK FOR REFRACTORY LININGS OF FURNACES

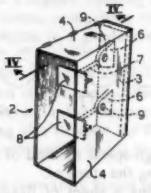
Ugo Brusa, Via Borgnis, Domodossola, Italy

Filed Feb. 14, 1975, Ser. No. 550,009

Claims priority, application Italy, Apr. 2, 1974, 68042/74

Int. Cl.² E04B 5/04, 1/16

U.S. Cl. 52—596 **12 Claims**



1. A composite block for refractory linings of metallurgical furnaces, which block comprises an envelope made of steel, having a substantially prismatic shape with tetragonal bases, a plate, made of steel of a type different from that of the said envelope and secured in correspondence of the periphery of one of the side faces of said envelope, and having a greater thickness than the envelope, said plate forming the block face which has to be exposed towards the interior of the furnace, and means which allow the anchoring of said plate in a mass of refractory material with which the inner space of the said envelope is filled, said plate preventing wear and thermal shock of said refractory material.

3,965,638

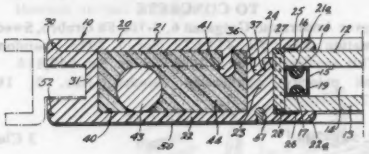
INSULATED GLASS PANEL

Irvin Newman, Cherry Hill, N.J., assignor to Ira W. Fine, Pennsauken, N.J.

Filed July 2, 1974, Ser. No. 485,165

Int. Cl.² E04C 2/34

U.S. Cl. 52—616 **12 Claims**



1. An insulated panel structure comprising: a pair of panels juxtaposed to define an air gap therebetween, a spacer disposed in said gap between inner peripheral margins of said panels, said spacer having at least a pair of opposed recesses confronting said inner margins of said panels, a resiliently deformable gasket disposed in each of said recesses and having a portion extending outwardly thereof to engage said inner margins, and frame means surrounding said panels and engaging outer peripheral margins of said panels for urging said panels toward one another to compress said gasket thereagainst, said frame means including a first frame member disposed on one side of said pair of panels and a second frame member disposed on the other side thereof, one of said frame members having an inner web portion extending along the peripheral edges of said panels, an outer web on said one member spaced from said inner web, said inner and outer webs spacing said frame members apart to define therebetween a cavity, a foam material contained in said cavity, and means providing complementary mating snap fasteners releasably fastening said inner web to the other of said members.

3,965,639

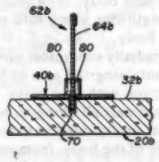
BEAM-REINFORCED CEILING PANELS

Edward J. Boarini, Arlington Heights, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Continuation of Ser. No. 383,210, July 27, 1973, abandoned, which is a continuation of Ser. No. 167,198, July 29, 1971, abandoned. This application Feb. 3, 1975, Ser. No. 546,220

Int. Cl.² E04C 2/38

U.S. Cl. 52—629 **3 Claims**



1. A reinforced ceiling panel comprising

a generally flat sheet having a front surface, a back surface, and opposite edge surfaces;

an elongate reinforcing member extending from one of said edge surfaces to the opposite edge surface between the remaining edge surfaces, said reinforcing member being secured along substantially its entire length flat against said back surface;

and a beam member secured to said reinforcing member so as to project from said back surface,

one of said reinforcing member and said beam member being provided with apertures and the other of said members being provided with outwardly extending connecting

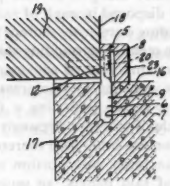
means for releasably engaging said apertures to connect said members together;
whereby said beam member reinforces said sheet.

3,965,640

FASTENER FOR SECURING A STRUCTURAL MEMBER TO CONCRETE

Erik Ingvar Andersson, Gotgatan 6, S-703 58 Orebro, Sweden

Continuation of Ser. No. 413,675, Nov. 7, 1973, abandoned.
This application Feb. 10, 1975, Ser. No. 548,814
Claims priority, application Sweden, Nov. 9, 1972, 14504/72
Int. Cl.² E04B 1/41
U.S. Cl. 52—704 3 Claims



1. A securement device of the type having a substantially solid pin portion that can be driven into a hole in a structural member of concrete or the like and having a head portion at one end of said pin portion to which another structural member can be secured for anchorage to the first mentioned structural member, wherein the pin portion of said securement device is characterized by:

A. an elongated substantially cylindrical body having a uniform radius along a substantial major portion of its length; and

B. a plurality of circumferentially equidistant axially elongated ridges on said body, each said ridge

1. extending lengthwise along said major portion of the length of the body,

2. having a flat radially outermost surface which is normal to a plane containing the axis of the body and which, at its intersection with said plane, is at a uniform distance from said axis all along its length,

3. being tapered to diminish in extent, as measured circumferentially of the body, from said one end of the pin portion, the opposite longitudinal edges of said flat surface thus being convergent towards one another and said plane in the direction away from said one end of the pin portion, and

4. having other surfaces which extend lengthwise along said edges of said flat surface and which cooperate with said flat surface to define substantially square corners extending along said edges

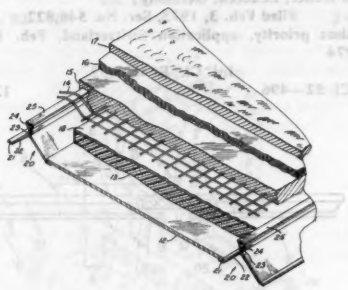
so that as the pin portion is driven progressively into a hole of a radius larger than that of said cylindrical body but smaller than that of the ridges, the corner portions of the ridges produce an increasing wedging effect upon the surface of the hole whereby circumferentially spaced, axially elongated zones of compression are created in the pin portion that resist its axial motion relative to the structural member having the hole.

3,965,641

SHEET METAL STRUCTURAL SHAPE AND USE IN INSULATED DECKING STRUCTURE AND METHOD

Frank E. Carroll, Barrington, Ill., assignor to Decks, Incorporated, Rolling Meadows, Ill.

Filed Apr. 4, 1974, Ser. No. 457,996
Int. Cl.² E04C 3/04, 5/065
U.S. Cl. 52—738 11 Claims



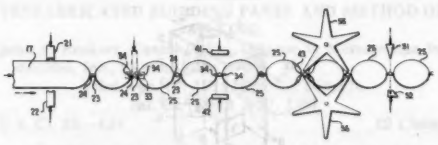
1. A sheet metal structural shape for use as a purlin or sub-purlin in deck construction which is symmetrical about a vertical bisecting plane having; a central vertical web of about ⅝ to about ⅝ inch in length, two legs projecting downwardly from the bottom of said web forming an angle of about 30° to about 90° between said legs having its vertex at the bottom of the web, said legs having a vertical depth of about 1⅛ to about 10 inches, each leg having a substantially horizontal flange projecting outwardly at its lower extremity, and a stiffening member at the upper edge of said web providing uplift resistance when surrounded by concrete.

3,965,642

METHOD AND APPARATUS FOR FILLING PLASTIC BAGS WITH LIQUID OR PARTICULATE MATERIAL

William H. Hills, and Shirley M. Hills, both of Melbourne Village, Fla., assignors to Hills Research & Development, Inc., Melbourne, Fla.

Filed Aug. 22, 1974, Ser. No. 499,558
Int. Cl.² B65B 9/08
U.S. Cl. 53—28 8 Claims



1. A continuous high-speed method of forming and filling plastic bags comprising the steps of:

continually advancing a sheet of flexible plastic material longitudinally to a plurality of operation locations in succession;

at a first location, forming a longitudinally-sealed tube from said sheet and inflating said tube with a gaseous medium;

at a second operation location, segmenting the inflated tube into individual interconnected, inflated and pressure-isolated plastic bags by sealing the tube generally transversely at fixed intervals along its length;

at a third operation location, filling each inflated plastic bag with flowable fill media by puncturing the bag with a fill nozzle and displacing the inflating gas with fill media introduced into the bag through said nozzle, the displaced gas being permitted to escape from said bag through the puncture about the nozzle periphery; and

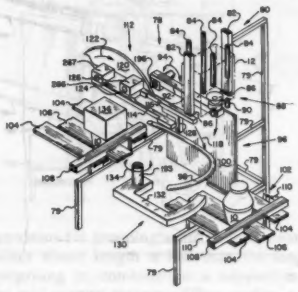
at a fourth operation location, sealing the bag about said puncture to prevent fill media from escaping through said puncture.

3,965,643

TOPPER UNIT, MACHINE AND METHOD

Earle Conrad Sherman, West Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.

Filed Oct. 10, 1975, Ser. No. 621,446
Int. Cl.² B65B 21/04, 43/30
U.S. Cl. 53—29 19 Claims



1. A topper unit for opening, applying and locking a pre-glued open ended carton to the top of a bottle, comprising:

a. a frame;

b. a hopper mounted on said frame and serving as a receptacle for a plurality of pre-glued and folded cartons;

c. means, associated with and located below said hopper, for removing the cartons one at a time from the hopper;

d. means, mounted on said frame and located beneath said hopper, for opening said cartons while said removing means is removing the cartons from the hopper;

e. means, associated with said frame, for moving and positioning a bottle beneath the opened carton;

f. means, associated with said frame, for pressing the previously opened carton on top of the bottle and locking it onto the bottle; and

g. means, associated with said frame, for squaring up the carton as it is being pressed on top of the bottle.

11. A method for withdrawing a pre-glued open ended and folded carton from a hopper, opening the carton and applying it to the top of a bottle, comprising the steps of:

a. providing a bottle in a predetermined position beneath the hopper;

b. withdrawing the pre-glued and folded carton downwardly and away from the hopper while turning it 90° from its previous position in the hopper, the withdrawing and turning serving also to open the folded carton so that its open end is downwardly facing and is positioned over the bottle; and

c. pressing the downwardly facing opened carton on top of the bottle while squaring up the carton until the carton is locked on the bottle.

3,965,644

APPARATUS AND METHOD FOR MAIL PREPARATION

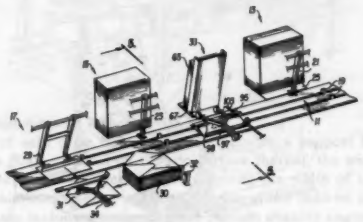
Lester H. Stocker, Phillipsburg, N.J., assignor to Bell & Howell Company, Phillipsburg, N.J.

Filed Oct. 31, 1975, Ser. No. 627,742
Int. Cl.² B65B 43/30
U.S. Cl. 53—29 8 Claims

1. An inserting machine for supplying insert sheets having pockets formed thereon, stuffing cards into said pockets and stuffing said insert sheets with cards in the pockets thereof into respective envelopes, said inserting machine comprising:

an insert raceway including a conveyor for receiving said insert sheets having pockets formed thereon at an insert-sheet supply station and intermittently conveying said insert sheets first to a pocket-stuffing station and then to an envelope stuffing station;

an insert-sheet supply means positioned at said insert-sheet supply station adjacent to said conveyor for sequentially placing individual insert sheets having pockets formed thereon on said conveyor;



an insert card stuffing means positioned at said pocket-stuffing station adjacent to said conveyor downstream of said insert-sheet supply station for engaging the pockets formed on insert sheets stopped at said pocket-stuffing station, opening said pockets, and inserting a card into each of said pockets;

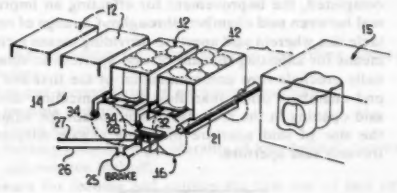
an envelope stuffing means positioned at said envelope stuffing station adjacent to said conveyor downstream of said pocket-stuffing station for supplying empty, open envelopes and stuffing each of said insert sheets with cards in the pockets thereof into an open envelope.

3,965,645

PACKAGE TIGHTENER AND METHOD

Robert H. Ganz, 8 Ridgecrest Road, Saddle River, N.J. 07458

Filed Aug. 26, 1974, Ser. No. 500,489
Int. Cl.² B65B 11/48
U.S. Cl. 53—32 6 Claims

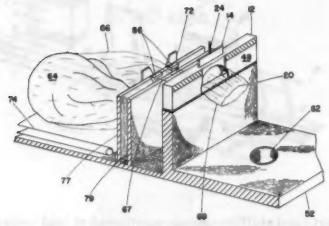


5. A method of tightening a moving partially formed package of the type including an article having sheet material overlaying the same and extending vertically down front and back sides of the article and terminating in a forwardly extending rear bottom panel and a rearwardly extending front bottom panel, said method comprising the steps of providing a predetermined path of movement for said partially formed package, providing a support roll extending across said predetermined path, moving said partially formed package along said predetermined path and over said support roll in contact therewith, retarding rotation of said support roll to frictionally engage the front bottom panel as the partially formed package moves forward past said support roll and thereby tensioning the front bottom panel and tightening the package, and thereafter permitting the support roll to rotate thus permitting the rear bottom panel to freely pass over the support roll.

3,965,646
ADJUSTABLE SEALING DEVICE

Robert Stanley Hawkins, Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Feb. 26, 1975, Ser. No. 553,388
Int. Cl.² B65B 31/02
U.S. Cl. 53—112 B 13 Claims



1. In an apparatus for evacuating and closing flexible, impervious receptacles such as pouches, bags and the like which have at least one opening and contain at least one product, said apparatus comprising:

A. a first vacuum chamber;

B. a second vacuum chamber adjacent to said first chamber;

C. means providing an aperture in flow communication with said chambers for passing a portion of said receptacle containing the opening through the aperture;

D. means to evacuate said first and second chambers independently of each other and to evacuate said receptacle; and,

E. means to close said receptacle when its evacuation is completed, the improvement for effecting an improved seal between said chambers throughout a range of receptacle size wherein said aperture-providing means includes means for adjusting the size of said aperture to substantially preclude flow communication of the first and second chambers other than flow communication through said opening in the receptacle, said means for adjusting the size of said aperture including a gate adapted to traverse said aperture.

3,965,647
BRIEF FOLDING AND PACKAGING APPARATUS

Carl F. Sjoman, Los Angeles, Calif., assignor to Team Industries, Los Angeles, Calif.

Filed Aug. 29, 1974, Ser. No. 501,693
Int. Cl.² B65B 63/04
U.S. Cl. 53—117 8 Claims

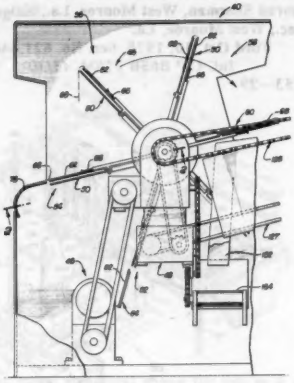
1. In an apparatus for packaging a man's brief, or similar article, the combination of:

a. means for folding the brief transversely thereof;

b. means for folding the transversely folded brief longitudinally thereof along spaced, substantially parallel longitudinal fold lines;

c. means for rolling the transversely and longitudinally folded brief into a substantially cylindrical configuration having an axis substantially parallel to the longitudinal fold lines;

d. means for opening a bag into which the folded and rolled brief is to be inserted; and

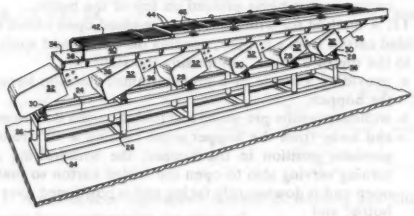


e. means for inserting the folded and rolled brief into the opened bag.

3,965,648
APPARATUS FOR LOADING FUEL PELLETS IN FUEL RODS

Robert J. Tedesco, Coraopolis, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 3, 1974, Ser. No. 430,421
Int. Cl. B65b 63/00
U.S. Cl. 53—126 8 Claims



1. Apparatus for loading fuel pellets into fuel rods comprising:

a base supporting a table having at least one row of fuel pellets thereon;

at least one fuel rod secured to the table upper surface and positioned in alignment with said pellets;

vibration means on said base connected with said table for imparting vibratory motion thereto;

said vibration means being mounted at an angle to a horizontal plane passing through the base to cause said table upon movement of said vibrator to cyclically move in a forward-upwardly backward-downwardly motion thereby advancing each pellet in each fuel rod a predetermined distance during each cycle.

3,965,649
APPARATUS FOR GROUPING ARTIFICIAL INSEMINATION STRAWS

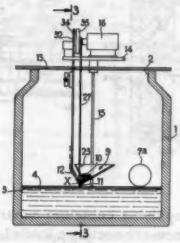
Maurice Jean-Pierre Cassou, 61300 La Sapaie Saint-Symphorien des Bruyeres-par-l'Aigle, France

Filed Feb. 13, 1975, Ser. No. 549,796

Claims priority, application France, Feb. 15, 1974, 74.05287

Int. Cl.² B65B *5/10*

U.S. Cl. 53—127 **11 Claims**



1. An apparatus for grouping artificial insemination straws in a container whose length is less than the length of the straws, comprising in combination a support means and, mounted on said support means: a filling station, a device for feeding containers one by one to the filling station, each of said containers having at said filling station a filling opening substantially contained in a plane which is substantially vertical, a device for feeding the straws one by one to a charging position in which the straw is substantially horizontal and substantially perpendicular to said plane, said filling station having a space which is divided by said plane into a first space part and a second space part, the container being located in said first space part and the straw being located in said second space part at said filling station, a charging device for shifting the straws one by one in a direction parallel to the direction of the length of the straw from said charging position to a charged position inside the container, and said straw feeding device comprising a straw supply means for supplying straws one by one to a substantially horizontal intermediate position in which the straw is oriented in a direction substantially parallel to said charging position but below the level of the lowermost part of the opening of the container, and an intermediate shifting device for shifting the straws one by one in a direction transverse to the length of the straw from said intermediate position to said charging position which charging position is disposed above said level and intersects the position of the lowermost straw in the container.

3,965,650
HIGH SPEED CASE PACKING MACHINE

Herbert H. Nussbaum, Bainbridge, Ga., assignor to Miller Hydro Company, Bainbridge, Ga.

Filed Jan. 13, 1975, Ser. No. 540,606

Int. Cl.² B65B *5/08, 21/06, 21/16*

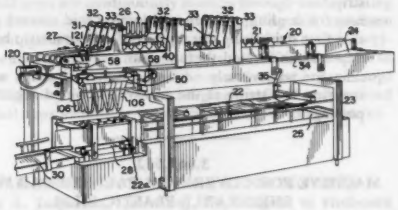
U.S. Cl. 53—166 **12 Claims**

1. In an in-line packing machine of the type having a plurality of side-by-side channels in which containers to be packed are advanced, and a packing station for transferring containers from said channels to desired packing positions in an underlying carton, said packing station comprising

a plurality of drop bar assemblies underlying respective ones of said container channels, said drop bar assemblies each including a continuous-loop drive chain presenting an upwardly-facing surface for frictionally engaging said containers,

drive means for powering said drive chains to advance said containers in each of said channels to said predetermined packing positions, and

release means for shifting said drive bar assemblies from positions under said channels to positions between said channels after said containers have arrived at said predetermined pre-packing positions to allow said containers to drop into said underlying carton,



the improvement wherein:

each of said drop bar assemblies includes a support bar having a guide channel on the top surface thereof, the width of said support bar, overall, not exceeding the width of said drive chain, and wherein at least a portion of the links on said drive chain include a projecting tab portion slidably engaged in said guide channel.

3,965,651
DEVICE FOR THE MANUFACTURE AND FILLING OF PACKAGES

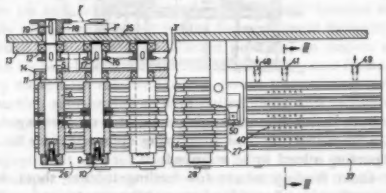
Erwin Reichlin, Waldegg, Walchwil, Switzerland

Filed Dec. 10, 1974, Ser. No. 531,214

Claims priority, application Switzerland, Dec. 14, 1973, 17592/73

Int. Cl.² B65B *1/02, 9/04*

U.S. Cl. 53—183 **5 Claims**



1. An apparatus for manufacturing and filling packages including

first and second strips of packaging materials;

a forming station including

a frame having a side plate;

a forming plate having a plurality of longitudinal grooves in one surface thereof;

means for feeding and guiding the first one of said strips along said plate in the direction of said grooves and adjacent said grooved surface;

said means for feeding including a plurality of longitudinally spaced positively driven forming rolls adjacent said one surface with said first strip between said rolls and said surface,

said side plate having means for rotatably supporting said rolls in cantilever;

means for driving said rolls;

said rolls having annular ridges shaped to mate with said grooves and to press said strip into said grooves;

the first one of said rolls at one end of said plate having a pair of ridges laterally spaced apart on opposite sides of the centerline of said first strip to form a pair of continuous depressions in said strip;

each successive downstream one of said rolls having additional pairs of ridges spaced further apart than the outermost ridges on the preceding roll to successively form

additional continuous grooves in said strip, working from near the center of said strip toward the outer margins thereof;

means downstream of said rolls for depositing material to be packaged in the elongated depressions formed in said first strip;

means for feeding, guiding and joining said second strip to said first strip along the regions of said first strip between depressions formed therein; and

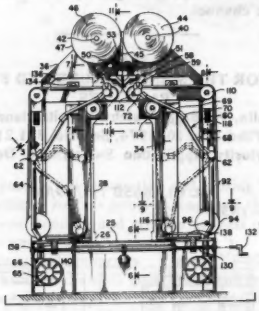
means for transversely sealing the joined strips and for severing the strips at the transverse joined regions into packages.

3,965,652

MACHINE FOR COVERING A PALLET LOAD WITH SHRINKABLE PLASTIC FILM

John B. Cimins, Paterson, N.J., assignor to J & H Co., Paterson, N.J.

Filed Oct. 30, 1969, Ser. No. 872,592
Int. Cl.² B65B *43/30, 53/02*
U.S. Cl. 53—183 **7 Claims**



1. Bulk shrink film packaging apparatus comprising:

a. a frame having load supporting means therein for supporting a load to be wrapped;

b. sheet feeding means for feeding tubular sheet downwardly toward said load supporting means; and

c. tube-gripping and holding means movable in opposite directions from the plane of the descending flat tubular sheet and positioned at a level above the load to be wrapped and below the sheet feeding means, said tube-gripping means being arranged to engage opposite sides of the flat tubular sheet as it is fed downwardly and spread them apart to form the sheet into a four-sided configuration and then hold it in said configuration and guide it downwardly around the load as the sheet-feeding means continues to feed the sheet downwardly,

said load supporting means including conveyor means for supporting a loaded pallet, said conveyor means being operative to position a pallet load immediately below said sheet feeding means.

3,965,653

PACKAGING APPARATUS

Bernard Lerner, Hudson, Ohio

Continuation-in-part of Ser. No. 139,453, May 3, 1971, Pat. No. 3,815,318. This application Feb. 28, 1973, Ser. No. 336,560
Int. Cl.² B65B *5/00, 7/02, 43/12, 51/14*
U.S. Cl. 53—187 **28 Claims**

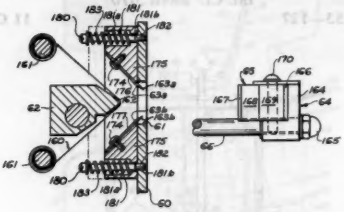
1. A packaging apparatus comprising:

a. structure establishing a path of travel for a packaging web to position a container forming portion of the web at a loading station; and

b. container closure and gripping means for:

i. closing a container portion after it has been loaded at the loading station;

ii. gripping the loaded container portion to isolate a region of the web from forces applied to a loaded container portion both by container contents and to effect separation of the container portion from the web; and,



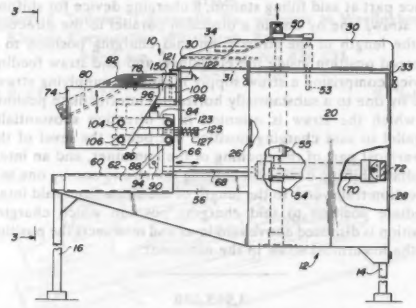
iii. thereafter applying container separation forces to a line of weakness connecting a loaded container portion to the remainder of the web, said separation forces being applied to the line of weakness while the container portion is being gripped to isolate said region from said separation forces.

3,965,654

BAGGING APPARATUS

Clarence Edmond Reubens, Decatur; Sterrett Paxton Campbell, and Lloyd Everett Marston, both of Atlanta, all of Ga., assignors to Paramount Packaging Corporation, Chalfont, Pa.

Filed July 21, 1975, Ser. No. 597,848
Int. Cl.² B65B *43/36*
U.S. Cl. 53—189 **12 Claims**

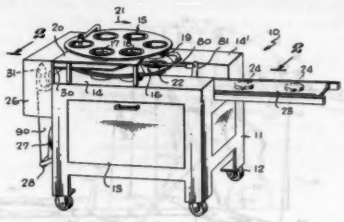


1. Bagging apparatus comprising a support structure, first and second horns mounted on said support structure, said second horn being shorter than said first horn, means connected to said second horn for moving said second horn toward and away from said first horn, a carriage supported by said support structure for movement toward and away from said horns, a portion of said carriage being below said first horn at one end of its movement, means on said carriage for supporting a stack of bags and for elevating the stack of bags, means including circuitry connected to said second horn and carriage for automatically cycling the same so that the carriage movement toward said horns causes the top bag to at least partially telescope over a portion of the horns and then causes the second horn to move away from the first horn to stretch the mouth of the bag, and means for causing the top bag to be open during such movement of the carriage toward the horns.

3,965,655
FOOD PRODUCT PACKAGING APPARATUS

William H. Schooler, Sr., 1913 Jackson St., Burbank, Calif. 91504, and William H. Schooler, Jr., 1013 N. Howard St., Glendale, Calif. 91207

Filed Dec. 30, 1974, Ser. No. 537,246
Int. Cl.² B65B *11/28*
U.S. Cl. 53—225 7 Claims

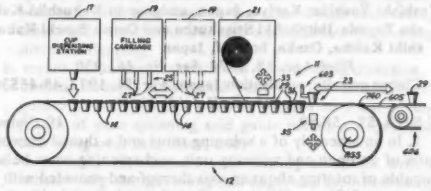


1. A food product wrapping machine comprising:
a base having a working surface;
a first and second means rotatably carried on said base in vertical fixed spaced apart relationship wherein each of said means are provided with a plurality of pockets in vertical registry for receiving said food product via gravity transference therebetween;
gating means operably disposed between said first and second means for supporting said food product during transition therebetween;
paper supply means operably carried on said base for supplying a sheet of paper between said first and second means and said gating means engagable with said food product during said gravity transference;
folding means interposed between said gating means and said second means for folding the edge marginal regions of said paper sheet about said food product;
control means interconnecting said above-mentioned means for timing and sequencing the operation thereof with respect to each other;
said paper supply means includes a cutting means having a reciprocably moving serrated cutting edge; and
clamping means operable to retain said paper sheet taut on opposite sides of said cutting edge.

3,965,656
CUP FILLING AND CAPPING APPARATUS

Ralph D. Gerben, Glen Burnie, Md., assignor to Solo Cup Company, Urbana, Ill.

Filed May 16, 1974, Ser. No. 470,379
Int. Cl.² B65B *3/14*
U.S. Cl. 53—282 22 Claims

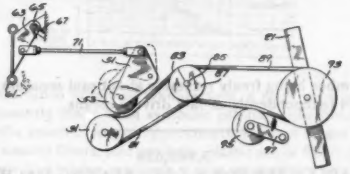


1. An apparatus for filling and closing individual cups comprising an endless flight conveyor having a plurality of openings arranged in longitudinally extending rows for receiving and holding individual cups while moving along a predetermined path of travel, means for driving said endless conveyor to continuously move the conveyor and cups along said predetermined path and through a series of stations, cup dispensing means along said path at a cup receiving station for inserting an individual cup into each of said openings while said conveyor is continuously moving, filling means at a filling station along said path for filling each of said cups while continuously moving through said filling station, means for heat sealing an individual cover to each of said cups at a covering station while said cups are continuously moving through said covering station, a continuously moving means for lifting said cups from said openings in said conveyor means, said lifting means carrying the cups forwardly while simultaneously lifting the same to positions above said openings and means for pushing said cups from said lifting means and discharging the filled and covered individual cups without arresting their continuous movement.

3,965,657
REAR SAFETY BUMPER FOR RIDER MOWERS

Herbert A. Jespersen, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 15, 1974, Ser. No. 460,779
Int. Cl.² A01D *35/26*
U.S. Cl. 56—10.2 6 Claims



1. A riding lawn mower comprising a frame, forward and rear wheel means mounted on said frame for engagement with the ground to support said frame above the ground, a bumper, means on said frame movably supporting said bumper rearwardly of said rear wheel means for movement between an extended position and a retracted position, an engine supported by said frame, a cutter blade carried by said frame for rotary movement relative thereto, power transmission means connecting said engine to said cutter blade and including a member movable relative to a first position permitting engagement of said transmission and to a second position affording disengagement of said transmission, and means connecting said bumper to said member so as to locate said member in said first position permitting engagement of said transmission when said bumper is in said extended position and in said second position to afford disengagement of said transmission when said bumper is in said retracted position.

3. A riding lawn mower in accordance with claim 1 wherein said power transmission means comprises an endless belt and said member comprises an idler pulley movable relative to said endless belt between a position removing slack so as to effect power transmission and a second position permitting slack so as to interrupt power transmission.

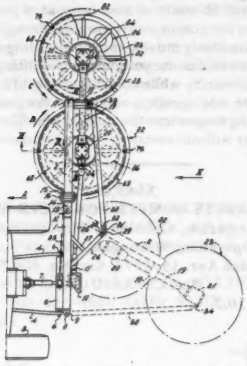
3,965,658
MOWING MACHINES

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed May 14, 1974, Ser. No. 469,772
Claims priority, application Netherlands, May 15, 1973, 7306705
Int. Cl.² A01D *55/22*
U.S. Cl. 56—192 29 Claims

1. A mowing machine comprising a mobile frame and mowing means supported on said frame, said mowing means including at least one mowing member that is rotatable about an upwardly extending axis, said mowing member having an outer circumference and cutting means adjacent said circumference, said machine having driving means connected to said mowing means to rotate said cutting means about said upwardly extending axis, at least one supporting member being rotatably mounted on said mowing member and said support-

ing member being rotatable about a separate axis of rotation that is spaced from said upwardly extending axis, said supporting member being freely rotatable about said separate axis of rotation independently of said driving means.



3,965,659

GRAIN LIFTER FOR A CORN REAPING MACHINE

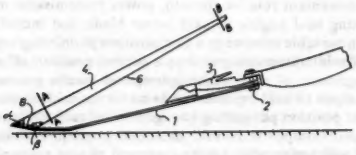
Gustav Schumacher, II, and Guenter Schumacher, both of 5231 Eichelhardt, Germany

Filed May 16, 1974, Ser. No. 470,571

Claims priority, application Germany, May 22, 1973, 2325916

Int. Cl.² A01D *65/02*

U.S. Cl. 56—313 **5 Claims**



1. In a reaping machine, an elongated supporting rod having an upper rear end region to be fixed on the reaper so that the supporting rod points forwardly and downwardly in the direction of motion, said supporting rod having a front tip region distant from and lower than said rear end region thereof, a lifting bar having a lower end welded only to said front tip region of said supporting rod and being inclined upwardly and backwardly from the front tip region of said supporting rod, said lifting bar gradually tapering and becoming narrower from its lower end upwardly toward an upper rear end region of said bar, said lifting bar being made of a metallic sheet material and having a pair of opposed side walls terminating in free rear edges and a substantially U-shaped front wall interconnecting said side walls, said side walls having a width which is of a maximum dimension at the lower end of said bar and which becomes gradually smaller toward the upper rear end region of the bar while said bar has a lower end which is welded to said front tip region of said rod, said lower end being situated in a plane which makes an acute angle with a forwardmost edge of said front wall and an obtuse angle with the rear free edge of said side wall to afford a secure welded connection of the bar to the front tip region of said rod, said rod having an upper surface situated in said plane.

3,965,660

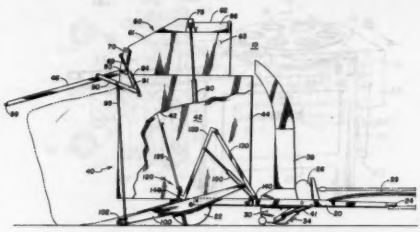
STACK FORMING APPARATUS

Glenn G. Kanengieter, Blooming Prairie, and Gerald E. Barry, Owatonna, both of Minn., assignors to Owatonna Manufacturing Company, Inc., Owatonna, Minn.

Filed Nov. 27, 1974, Ser. No. 527,703

Int. Cl.² A01D *85/00*

U.S. Cl. 56—344 **15 Claims**



1. A stack forming apparatus comprising: a chassis having a pair of wheels intermediate the extent of the same and supporting the chassis with a hitch at one end thereof; a crop receiving container positioned on said chassis over said wheels and extending from the other end thereof intermediate the extent of the chassis, said crop receiving container having upstanding sides and an open upper front side for the introduction of loose crop therethrough; a pick up means positioned by said chassis forward of said container and having a discharge chute extending adjacent to the open front side of the container; a movable roof for said container having downwardly projecting rear and side portions integral therewith and an open front extremity; a pivoted rear door for said container pivoted at the rear upper edge of the upstanding sides of the container and adapted to pivot from the top edge of the container; means including a first actuator means connected to the upstanding sides of the container adjacent the rear end thereof for pivoting rear of roof, and a second pair of actuator means connected to the top of the roof adjacent the forward edge of the same and to the sides of the container intermediate the extent thereof with said actuators pivoting the roof at the front and back through different arcs, said container having a floor pivoted intermediate the extent of the same and adjacent the axis of said wheels, and a push type unloader connected to the front wall of the container and adapted to push a stack within the container along the floor thereof causing pivoting of the floor as the stack is discharged

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3,965,661

THREAD DRAWOFF TUBE FOR AN OPEN-END SPINNING UNIT

Yoshiaki Yoshida, Kariya, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Daiwa Boseki Kabushiki Kaisha, Osaka, both of, Japan

Filed Apr. 18, 1974, Ser. No. 461,930

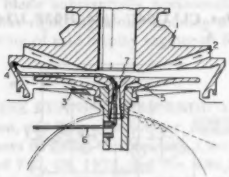
Claims priority, application Japan, Apr. 21, 1973, 48-45530

Int. Cl.² D01H *1/12, 13/04*

U.S. Cl. 57—58.89 **10 Claims**

1. In an assembly of a spinning rotor and a thread drawoff tube of an open-end spinning unit, said spinning rotor being capable of rotating about an axis thereof and provided with a ring shaped fiber collecting surface formed at an inside ring shaped wall having maximum rotational diameter, said thread drawoff tube disposed coaxially in stationary condition at a position along an extended line of said axis of said spinning rotor and provided with a hollow yarn guide for delivering a continuous thread from said assembly and a flange portion extending from an inside terminal of said hollow tube toward said fiber collecting surface of said spinning rotor, the improvement comprising an improved thread drawoff tube pro-

vided with a thread passage, said thread passage having frictional resistance along a portion of said thread passage contacted by said thread having inner and outer ends for creating a rolling motion of said thread by frictional contact therewith when said thread is being delivered from said assembly, said thread passage provided with a continuous trumpet shaped



friction surface in said portion of said thread passage, said portion of said thread passage having surface variations providing an effective coefficient of friction of said frictional resistance that gradually decreases toward the edge of said flange portion, said surface variations extending from said inner and outer ends of said portion of said thread passage and continuously contacting said thread.

3,965,662

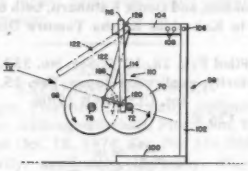
FALSE TWISTING DEVICE

Richard C. Spurgeon, R.D. No. 2, Lansdale, Pa. 19446

Filed Oct. 16, 1974, Ser. No. 515,331

Int. Cl.² D02G *1/08*

U.S. Cl. 57—77.33 **4 Claims**



1. In apparatus for false twisting yarn, the combination comprising

a. a plurality of friction discs alternate and intervening ones of which respectively are revolvable about laterally spaced generally parallel axes, said discs being disposed with said alternate discs to the rear of said intervening discs, and with the rims of said alternate and intervening discs overlapping,

b. means for turning said discs in yarn twisting direction,

c. means through which said yarn may be threaded for guidance and coaction with said discs to form of the length of yarn spanning said guide means a single loop extending over said discs, and

d. a plurality of members each having a section with a substantially straight elongated edge, said members being adjustably fixed in position and operable for bringing said edges into engagement with the loop of yarn extending over said discs and pressing the same downwardly and rearwardly between each pair of adjacent discs a selected distance, said yarn being free, in response to adjustment of said members to assume a position along said edges whereat vibration of said yarn circumferentially of said discs is substantially eliminated and said yarn is twisted in place on the rims of said discs.

3,965,663

SPUN YARN

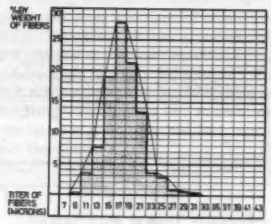
Hans Goetti; Anton Mittler, and Hermann Forrer, all of Burglen, Switzerland, assignors to Kammgarnspinnerei Burglen, Burglen, Switzerland

Continuation-in-part of Ser. No. 300,993, Oct. 26, 1972, abandoned. This application Sept. 18, 1974, Ser. No. 507,298

Claims priority, application Switzerland, Nov. 1, 1971, 15905/71

Int. Cl.² D02G *3/04*

U.S. Cl. 57—140 BY **7 Claims**



1. As a novel article of manufacture, a spun yarn at least predominantly made from synthetic plastic staple fibers and having the touch of a yarn approximating that of a yarn made only of natural fibers, said synthetic plastic staple fibers of said spun yarn comprising synthetic plastic staple fibers of at least three different titers including a medium titer which is within a range of about 6 microns of the average titer of the synthetic plastic fibers in said yarn, a fine titer which is at most about 15 microns less than said average titer and a coarse titer which is at most about 15 microns in excess of said average titer, said fibers of medium titer constituting a minimum of about two-thirds of the weight of the synthetic plastic fibers in said yarn.

3,965,664

METHOD OF MAKING SPUN YARN

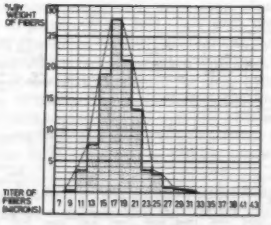
Hans Goetti; Anton Mittler, and Hermann Forrer, all of Burglen, Switzerland, assignors to Kammgarnspinnerei Buerglen, Buerglen, Switzerland

Continuation-in-part of Ser. No. 300,993, Oct. 26, 1972, abandoned. This application Sept. 18, 1974, Ser. No. 507,297

Claims priority, application Switzerland, Nov. 1, 1971, 15905/71

Int. Cl.² D02G *3/04*

U.S. Cl. 57—157 R **14 Claims**



1. In a method of making spun yarns from staple fibers, the steps of forming a mix which comprises synthetic plastic staple fibers of at least three different titers including a medium titer which is within a range of about 6 microns of the average titer of the synthetic plastic fibers in said mix, a fine titer which is at most about 15 microns less than said average titer and a coarse titer which is at most about 15 microns in excess of said average titer and wherein the fibers of said medium titer constitute a minimum of about two-thirds of the weight of the

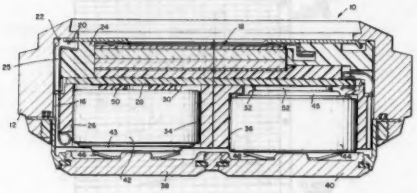
synthetic plastic fibers in said mix; and spinning said mix so as to convert it into a spun yarn.

3,965,665

ELECTRONIC WATCH CONSTRUCTION

Bela Somogyi, Costa Mesa, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 31, 1975, Ser. No. 563,926
Int. Cl.² G04C 3/00; H01R 11/22
U.S. Cl. 58—23 BA 9 Claims



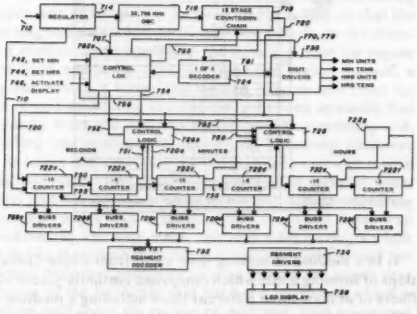
1. In combination in an electronic watch:
a support for carrying components of said electronic watch and an electric contact for connection of battery voltage for at least in part powering said electronic watch;
a nonmetallic resilient electrically conductive pad positioned against said electric contact on said support;
a battery having a contact and having its contact positioned against said resilient electrically conductive pad; and
means engaging said battery and said support for physically restraining said battery and support so that said resilient electrically conductive pad is maintained in a stressed, resiliently deflected position to maintain an area of electric contact on said battery contact and said electric contact on said support substantially as large as a battery contact to spread both electric contact area and mechanical force from said battery onto said support.

3,965,666

INJECTION LOGIC ELECTRONIC WATCH HAVING A CURRENT REGULATED OSCILLATOR

Clark R. Williams, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 19, 1974, Ser. No. 443,895
Int. Cl.² G04C 3/00; G04B 19/30; H03K 1/12
U.S. Cl. 58—23 BA 14 Claims



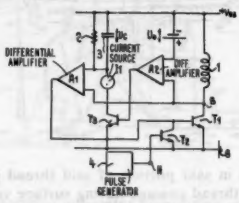
1. An electronic digital watch system comprising:
a. a current regulator and oscillator serially coupled between first and second system reference potentials; and
b. bipolar electronic timekeeping circuitry coupled to said oscillator for receiving a timing signal.

3,965,667

DEVICE FOR THE MAINTENANCE AND CONTROL OF THE OSCILLATIONS OF THE BALANCE WHEEL OF A TIMEPIECE

Igor Scherrer, Colombier, and Pierre Hersberger, Neuchatel, both of Switzerland, assignors to Ebarches S.A., Neuchatel, Switzerland

Filed July 9, 1974, Ser. No. 486,842
Claims priority, application Switzerland, July 19, 1973, 10573/73
Int. Cl.² G04C 3/04; H03F 3/34
U.S. Cl. 58—28 A 12 Claims



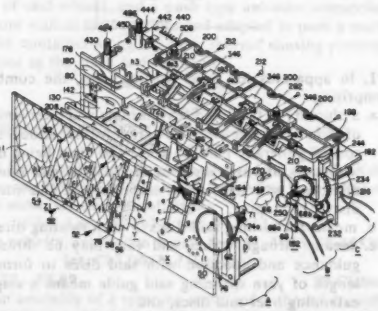
1. A device for maintaining constant amplitude of oscillation of a balance wheel of a timepiece using an electrodynamic maintenance system, comprising means for generating a first signal the amplitude of which varies with the amplitude of said oscillation, means for generating a second reference signal, means for comparing said first and second signals and producing a third signal having a voltage level and polarity determined by said comparison, means for applying driving pulses to said balance wheel, and means for regulating said driving pulses in accordance with said third signal.

3,965,668

SHUTTER TYPE DIGITAL CLOCK

Suzuki Tomokazu, and Doma Katuharu, both of Tokyo, Japan, assignors to Kabushiki Kaisha Tamura Denki Seisakusho, Japan

Filed Feb. 28, 1975, Ser. No. 553,968
Claims priority, application Japan, Dec. 25, 1974, 50-700
Int. Cl.² G04B 19/00
U.S. Cl. 58—126 E 10 Claims



1. A shutter type digital clock comprising a display unit base plate in which a plurality of display segment groups each having a plurality of display segmental openings arranged in the form of a figure "8" are formed, a plurality of shutter units disposed behind said base plate for switching said display segmental openings, a plurality of controlling mechanisms for controlling mechanical positions of shutter blades of said shutter units in association with a time-identified shifting mechanism, and interior light sources disposed behind said shutter blades for internally illuminating said display segmental openings, wherein each of said plurality of shutter units

associated with respective display segment groups comprises a first shutter blade substantially vertically movable for switching an upper segmental opening and a lower segmental opening of said display segmental openings, a second shutter blade substantially vertically movable for switching an intermediate segmental opening of said display segmental openings, a third shutter blade substantially horizontal movable for switching an upperright segmental opening and an upper-left segmental opening of said display segmental openings, and a fourth shutter blade substantially horizontally movable for switching a lower-right segmental opening and a lower-left segmental opening of said display segmental openings.

3,965,669

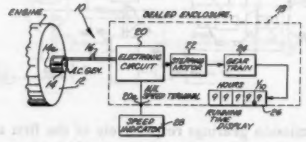
ENGINE RUNNING TIME INDICATOR

Gerald L. Larson, and Roger F. Kuether, both of Battle Creek, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 18, 1975, Ser. No. 550,509

Int. Cl.² G07C *3/02*; G04F *8/00*

U.S. Cl. 58—146 **17 Claims**



1. A running-time indicator for use with an engine comprising generator means driven by said engine for generating electric power above and below a threshold power level when the speed of said engine is respectively above and below a predetermined speed, and electronic clock means including means for measuring time that elapses only while said generated electric power is above said threshold power level, said electronic clock means being electrically powered solely by said generator means.

3,965,670

EXPANSION BRACELET

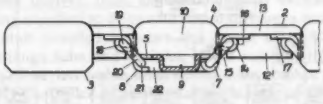
Gerhard Ihringer, Pforzheim, Germany, assignor to Rodi & Wienenberger, Aktiengesellschaft, Pforzheim, Germany

Filed Oct. 18, 1974, Ser. No. 516,006

Claims priority, application Germany, May 16, 1974, 2423734

Int. Cl.² F16G *13/24*

U.S. Cl. 59—79 R **4 Claims**



1. An expansion bracelet, particularly for wristwatches, comprising a row of connected links which includes at its end portions a plurality of terminal links and which tapers in its width in direction inwardly of said end portions, each of said links comprising a plate member having a pair of first edge portions extending transversely of said row, and a pair of second edge portions extending longitudinally of said row, a pair of solid outer members each connected to one of said second edge portions and being spaced from one another transversely of said row, a solid inner member located between said outer members and in part projecting beyond them in direction longitudinally of said row, said inner member having an underside facing towards said plate member and provided with a pair of transversely extending channels, a pair of substantially C-shaped brackets, each having a bight portion pivotably received in one of said channels and a pair of leg portions, the leg portions of one of said brackets being pivotably connected to one of said first edge portions of said plate member so that one bracket can be tilted longitudinally of said row out from between said outer members, and a pair of biasing springs received in the respective channels in engagement with the respective brackets and permanently resisting such tilting thereof, the outer members of at least some of said terminal links being formed upwardly of the associated plate members with transversely aligned bores; a pair of telescopable spring bars, one for each end portion of said row, each spring bar being insertable into and removable from the aligned bores of said outer members of respective ones of said terminal links for releasably attaching connecting members to the respective terminal links; and a pair of hook-shaped connecting members each having a substantially tubular portion embracing the respective spring bar and being provided with a cutout permitting insertion of a tool to compress said spring bar so that the latter may be removed from said aligned bores after insertion thereinto.

3,965,671

STRAP FOR WRIST WATCH

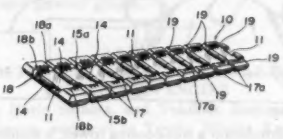
Yoshinobu Kodera, Chiba, Japan, assignor to Bear Co. Ltd, Tokyo, Japan

Filed Dec. 5, 1974, Ser. No. 529,963

Claims priority, application Japan, Sept. 25, 1974, 49-115253; Sept. 25, 1974, 49-115254; Sept. 25, 1974, 49-115255

Int. Cl.² F16G *13/00*

U.S. Cl. 59—80 **2 Claims**



1. A strap adapted for use with a wrist watch, comprising:

a plurality of inner strap elements each composed of a square main body of metal plate and having opposed sides thereof formed with one or two tubular flanges said tubular flanges being so arranged that the tubular flange or flanges of one side of said inner strap element are adapted to be engaged in axial alignment with the tubular flange or flanges of the associated side of the next adjacent inner strap elements when said inner strap elements are arranged in juxtaposition, said inner strap elements being pivotally connected with one another side by side in series with said tubular flanges engaged with associated tubular flanges of the next adjacent inner strap elements;

a plurality of connecting pins inserted through said tubular flanges thus axially aligned with the next adjacent ones while permitting said inner strap elements to be pivotal about the side edge or edges thereof relative to one another;

a plurality of ornamentally designed outer strap elements of the number corresponding to that of said inner strap elements, each having a central portion of the reverse or inner side surface thereof formed with a transverse groove traversing the width thereof, the size and configuration of said groove being of such an extent as to permit at least the main body of said inner strap elements to be fitted within said groove, and the depth of said groove being larger than the overall thickness of said inner strap element, said outer strap elements being arranged in juxtaposition with the respective grooves in alignment with one another in which grooves are fitted the main bodies of the thus previously connected inner strap ele-

ments while still permitted to make said pivotal movement; and

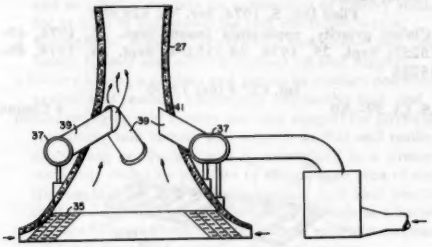
securement means for securing the outer strap elements with respect to the inner strap elements thus fitted within said grooves in such a manner that said central transverse grooves have upper edges of the opposed end walls thereof subjected to caulking so that said upper edges are inwardly stretched like comb teeth to cover end edges of the associated inner strap elements, the caulked portions finding themselves lower or inner than portions of the outer strap elements other than the groove portions, wherein said outer strap elements have opposed end portions other than the portions where said central transverse grooves are formed so configurated that said connecting pins have ends thereof blocked against said end portions to be prevented from making axial movement thereof.

3,965,672

WET COOLING TOWER WITH PLUME ELIMINATOR

James O. Stephens, Hamilton, Canada, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 23, 1974, Ser. No. 472,774
Int. Cl.² F02C 7/34; F28C 1/00
U.S. Cl. 60—39.5 **6 Claims**



1. In combination a wet cooling tower, a header subtending at least a portion of said cooling tower, means for supplying hot gases to said header, a plurality of conduits extending from said header into said cooling tower, each of said conduits being inclined upwardly and being generally disposed tangentially with respect to a circle disposed within the cooling tower, whereby hot gases flowing through said conduits follow a generally upwardly swirling path increasing the temperature and velocity of the upwardly flowing moisture laden air inducing mixing and lifting the moisture laden air into the upper atmosphere.

3,965,673

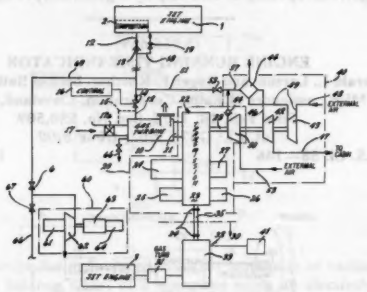
APPARATUS FOR STARTING AIRCRAFT ENGINES AND FOR OPERATING AUXILIARY ON-BOARD POWER GENERATING EQUIPMENT

Helmut Friedrich, Bremen, Germany, assignor to Vereinigte Flugtechnische Werke-Fokker Gesellschaft mit beschrankter Haftung, Germany

Filed May 20, 1974, Ser. No. 471,327
Claims priority, application Germany, May 19, 1973, 2375592; Mar. 22, 1974, 2413882; Mar. 28, 1974, 2414918
Int. Cl.² F02C 7/26, 7/32
U.S. Cl. 60—39.14 **24 Claims**

1. Apparatus for starting aircraft engines and driving auxiliary equipment, comprising two independently operating auxiliary gas turbines respectively individually connected to two aircraft engines for driving them for starting;

a first and second plurality of auxiliary equipment each plurality including at least one distribution transmission gearing, an electric generator, an auxiliary compressor and a hydraulic pump all being drivingly connected to the gearing, each of said pluralities establishing a power park operating independently from the respective other one, so that both or either can provide for the respective electric and hydraulic power in the aircraft; at least one of the plurality further including an air turbine drivingly connected to the respective transmission gearing, a heat exchanger receiving compressed air from the respective auxiliary compressor, and providing air to the air turbine, the air turbine discharging decompressed air into the cabin of the aircraft;



the transmission gearings respectively of the first and second pluralities of auxiliary equipment being connected to the two gas turbines and being driven therefrom;

the auxiliary equipment of the first and second pluralities being driven by the respective gas turbine independently from the two aircraft engines, the air turbine acting as load relief; and

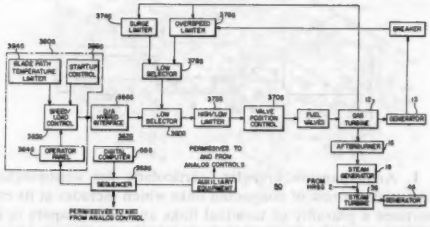
means for providing compressed air to the gas turbines.

3,965,674

COMBINED CYCLE ELECTRIC POWER PLANT AND A GAS TURBINE HAVING A BACKUP CONTROL SYSTEM WITH AN IMPROVED FEEDFORWARD ANALOG SPEED/LOAD CONTROL

Milton M. Hobbs, and Roy Kiscaden, both of Springfield, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1974, Ser. No. 495,693
Int. Cl.² F02C 7/62
U.S. Cl. 60—39.18 B **12 Claims**



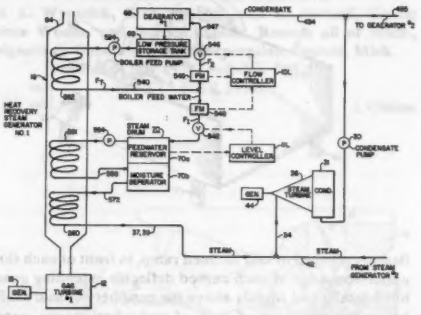
8. A control system for an electric power plant gas turbine comprising an automatic control and a backup control, means for controlling the flow of fuel to said gas turbine under automatic and manual control, said backup control including a speed/load control for generating a feedforward fuel demand signal for application to said fuel control means during speed and load control substantially free of dependence on speed and load parameter feedback and substantially free of forward controller action, and means for limiting the magnitude of the fuel demand signal for turbine protection purposes.

3,965,675

COMBINED CYCLE ELECTRIC POWER PLANT AND A HEAT RECOVERY STEAM GENERATOR HAVING IMPROVED BOILER FEED PUMP FLOW CONTROL

Lyle F. Martz, Verona, Pa., and Richard J. Plotnick, Cherry Hill, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1974, Ser. No. 495,724
Int. Cl.² F01K 23/10, 13/02
U.S. Cl. 60—39.18 B 27 Claims



1. A combined cycle electric power plant comprising:

a. at least one gas turbine including an exit through which heated exhaust gases pass;

b. means for generating steam at varying rates dependent upon the load placed upon said steam turbine, coupled to said gas turbine exit by transferring heat from the exhaust gases to a fluid passing through said steam generating means;

c. a steam turbine coupled to said steam generating means and driven by the steam supplied thereby;

d. means for generating electric power by the driving power of said turbines;

e. condenser means for receiving and converting the spent steam from said steam turbine into condensate;

f. means for controlling the operation of said turbines and said steam generating means;

g. said steam generating means including first and second heat exchange tubes, each having an inlet and outlet, said outlet of said first heat exchange tube being coupled to said inlet of said second heat exchange tube, pump means for directing the condensate from said condenser serially through said first and second heat exchange tubes, the steam derived from said second heat exchange tubes being supplied to drive said steam turbine, a recirculation conduit coupled between the outlet of said first heat exchange tube and its inlet, and a recirculation control valve inserted within said recirculation conduit and selectively controlled to permit a variable recirculation flow to said inlet of said first heat exchange tube; and

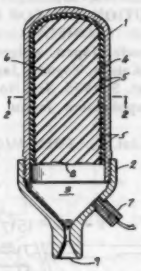
h. said controlling means comprising pump control means for actuating said pump to establish fluid flow through said first heat exchange tube at a substantially constant rate set for all loads imposed upon said steam turbine to achieve an optimum heat transfer between the exhaust gases and the fluid directed through said steam generating means to provide sufficient steam to said steam turbine at maximum load, and valve control means for controlling said valve to permit a variable, first flow through said recirculation conduit proportional to the difference between the constant flow established by said pump through said first heat exchange tube and a second flow to said second heat exchange tube, the second flow being set in accordance with the load imposed upon said steam turbine.

3,965,676

SOLID ROCKET MOTOR

Otto G. Schaffling, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Oct. 2, 1961, Ser. No. 143,275
Int. Cl.² F02K 9/04
U.S. Cl. 60—255 10 Claims



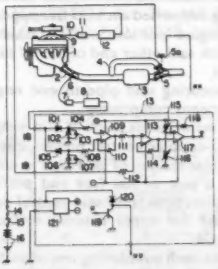
1. In combination with a vessel forming a rocket motor combustion chamber, a rubber-base liner having one surface firmly adhering to the chamber, the opposite surface of said rubber-base liner having a plurality of discrete powder grains partially embedded therein, each of said powder grains having a portion extending from said opposite surface of said rubber-base liner, and a propellant charge substantially filling the lined portion of said chamber, said propellant charge firmly adhering to said liner and enveloping each of said extending portions of said powder grains.

3,965,677

MISFIRE DETECTING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Kenji Goto; Norio Shibata, and Yukihide Hashiguchi, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 25, 1975, Ser. No. 561,692
Claims priority, application Japan, Aug. 30, 1974, 49-98876
Int. Cl.² F02B 75/10, 77/08
U.S. Cl. 60—277 10 Claims



7. An internal combustion engine comprising: a catalytic converter incorporated in an exhaust pipe of the engine; a by-pass pipe connected in parallel with said converter; a control valve for selectively passing exhaust gas of the engine through either of said converter and said by-pass pipe; means to operate said control valve; means to detect a maximum value of a pulsating exhaust pressure of the engine; means to detect a minimum value of the pulsating exhaust pressure; means to detect a suction pressure and provide a value proportional to the suction pressure; means to form a difference

between the maximum value and the minimum value; addition means to add the difference to the value proportional to the suction pressure; and means to compare the result of addition of the addition means with a predetermined value and energize said means to operate said control valve.

3,965,678

AIR DISTRIBUTION PIPE FOR EXHAUST GAS MANIFOLD

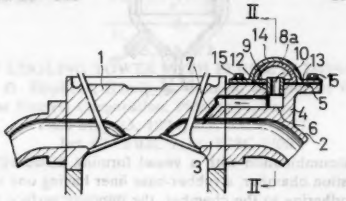
Kazuhiro Shiki, Toyoda, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyoda, Japan

Filed Mar. 5, 1975, Ser. No. 555,434

Claims priority, application Japan, Sept. 10, 1974, 49-109066[U]

Int. Cl.² F01N 3/10

U.S. Cl. 60—305 **19 Claims**



1. In a device for supplying additional combustion air into exhaust ports of a multi-cylinder internal combustion engine, wherein said air is delivered from a source of air supply and distributed into said exhaust ports through a plurality of air distribution bores formed in an engine portion and each communicating at one end with one of said exhaust ports, the improvement which comprises:

a horizontally disposed air distribution pipe secured to said engine portion and communicating at one end with said source of air supply, said pipe having along at least a portion of its length a semi-circular cross-section defining a flat bottom wall formed therethrough with a plurality of apertures through which said air leaves said pipe, said pipe being closed at the other end;

said engine portion having an at least partly flat upper exterior surface at which said air distribution bores are open at the other end thereof, said flat bottom wall of said pipe being supported on said flat upper exterior surface of said engine portion, each of said apertures being aligned with said other end of one of said air distribution bores; and

means for securing said pipe to said engine portion, said securing means comprising:

at least two metal bands, each of said metal bands comprising a semi-circular central portion encircling said semi-circular cross-section of said pipe in close contact therewith and a pair of flat free end portions extending in opposite directions from said central portion and resting against said flat upper exterior surface of said engine portion; and

a pair of bolts each connecting one of said free end portions to said upper exterior surface of said engine portion.

3,965,679

WAVE ENERGY MACHINE

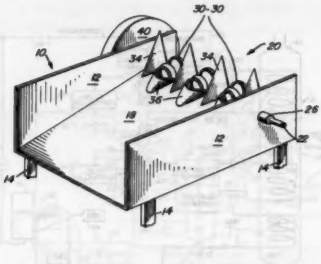
Erasmus J. Paradiso, R.F.D. No. 1, West Edmeston, N.Y. 13485

Filed June 14, 1974, Ser. No. 479,545

Int. Cl.² F16H 41/04

U.S. Cl. 60—398 **5 Claims**

1. In a wave energy device, the combination of a generally trough-shaped member having upstanding side walls, and an inclined ramp extending longitudinally between the side walls and having a terminal upper edge disposed inwardly of one end of the wall, a driven shaft rotatably mounted in said side walls adjacent the terminal edge of the ramp, a plurality of wheel means mounted on said shaft between said side walls, smoothly-rounded buckets secured on each of said wheel means, the open portions of said buckets when each is in its generally vertically uppermost position facing said inclined ramp, slots in said inclined ramp aligned with and receiving said buckets during rotation of the wheel means, curved deflectors secured to said inclined ramp, in front of each slot, the uppermost edge of each curved deflector extending generally horizontally and slightly above the periphery of said shaft, but below the periphery of each of said wheel means, generally triangularly-shaped deflectors disposed alongside each curved deflector, each secured to said inclined ramp, each extending vertically above the uppermost edges of the buckets, a plurality of turbine guards secured to the underside of said inclined ramp, generally surrounding each of said slots and each of said wheel means and buckets thereon.



3,965,680

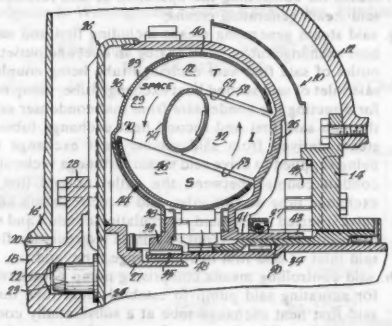
HYDROKINETIC DEVICE

Harold L. Cottrell, Kansas City, Mo., and Anthony C. Mamo, Arlington Heights, Ill., assignors to Power Control, Inc., Chicago, Ill.

Filed Jan. 14, 1975, Ser. No. 540,837

Int. Cl.² F16D 33/06

U.S. Cl. 60—357 **28 Claims**



1. A hydrokinetic device comprising a fluid containing housing, impeller blade means located in said fluid containing housing for always effecting fluid flow in one direction and adapted to be connected to an input shaft, turbine blade means located in said fluid containing housing for effecting fluid flow in the same one direction and adapted to be connected to an output shaft, both of said blade means being adapted to rotate relative to one another, when rotated said impeller blade means developing a head in said one direction and said turbine blade means developing a head substantially unopposing the head developed by said impeller blade means,

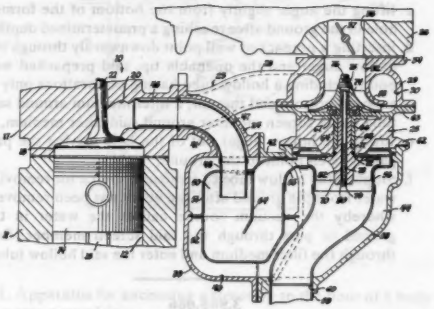
and means for emptying and filling said fluid containing housing while said blade means are rotated for varying the amount of fluid operated on by said blade means, whereby the device has a power capacity alterable by varying the amount of fluid operated on by said blade means.

3,965,681

INTERNAL COMBUSTION ENGINE AND TURBOSUPERCHARGER THEREFOR WITH HEAT PIPE FOR INTAKE MIXTURE HEATING

Floyd A. Wyczalek, Birmingham; John L. Harned, Grosse Pointe Woods, and Ora M. Smith, Romeo, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed June 30, 1975, Ser. No. 591,274
Int. Cl.² F02B 29/02
U.S. Cl. 60—599 3 Claims



1. For use in combination with an internal combustion engine, a turbosupercharger comprising

housing and support means defining spaced inlet and exhaust passages,

a rotatable member mounted in said support means and including a central shaft having a vaned compressor wheel at one end and a vaned turbine wheel at the other end, said turbine, shaft and compressor being rotatable as a unit within said housing and support means, said turbine being disposed within said exhaust passage and arranged to be rotatably driven by exhaust gases passing therethrough and said compressor wheel being disposed within said inlet passage and arranged to compress to a higher pressure inlet mixtures passing therethrough,

said rotatable member having an enclosed cavity extending through said central shaft and within said turbine and compressor wheels, the walls of said cavity being in heat exchange relation with the vanes of said turbine and compressor wheels at their respective ends of said cavity and

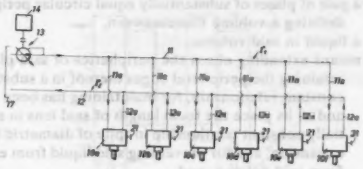
a vaporizable heat transfer fluid in said cavity, said fluid having a boiling temperature intermediate the normal operating temperatures of said turbine and compressor wheels whereby, in use, heat picked up from the exhaust gases by the turbine wheel vanes will heat and vaporize fluid disposed at the turbine wheel end of the cavity while vaporized fluid will be condensed on the cooler walls of the compressor wheel end of the cavity transferring heat through the compressor wheel vanes to the inlet mixture being compressed thereby.

3,965,682

HYDRAULIC INSTALLATION, MORE PARTICULARLY FOR DRIVING WARPING RETAINING WINCHES ON BULK CARGO SHIPS

Hans Herchenröder, Varreigraben, Germany, assignor to Friedrich Kocks GmbH, Bremen, Germany

Filed July 2, 1974, Ser. No. 485,685
Claims priority, application Germany, July 20, 1973, 2336897
Int. Cl.² F16D 31/02
U.S. Cl. 60—420 20 Claims



1. A hydraulic system comprising:

a. a main pump for pumping hydraulic fluid;

b. a main supply line and a main return line connected to said pump to form a main hydraulic circuit;

c. means to drive said main pump so as to maintain a constant pressure within said main hydraulic circuit;

d. a plurality of variable volume hydraulic adjusting motors, each driving a device, such as warping or retaining winches;

e. branch line means connecting each of the variable volume hydraulic adjusting motors in parallel to said main supply line and said main return line;

f. an adjustable volume regulator disposed in the branch line means of each variable volume adjusting motor to regulate the volume of hydraulic fluid used by said motors;

g. means to adjust the torque of each of said variable volume hydraulic adjusting motors; and

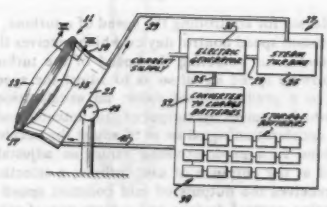
h. means to control the torque adjusting means and the adjustable volume regulator of each motor in dependence on one another.

3,965,683

SOLAR ELECTRICAL GENERATING SYSTEM

Sydney Dix, 48 The Point, Coronado, Calif. 92118

Filed May 9, 1974, Ser. No. 468,399
Int. Cl.² F03G 7/02; G02B 1/06
U.S. Cl. 60—641 14 Claims



6. Apparatus for generating electrical current including means for capturing solar rays comprising

a lens having

a pair of plates having a volume enclosed therebetween,

means for substantially sealing said volume while allowing for expansion and contraction of said plates as they are heated and cooled by the sun,

liquid means within said volume, and

means for passing an electrical current through said liquid means to control the chemical composition of said liquid means,

means for heating a fluid by means of the solar rays passing through said lens, and

means for extracting energy from the fluid thus heated and for converting the energy into electrical current.

9. Apparatus for generating usable energy from solar energy comprising

a lens including

a pair of plates of substantially equal circular peripheries, defining a volume therebetween,

a liquid in said volume,

means extending about the peripheries of said plates for retaining the peripheral edges thereof in a substantially constant relationship, for maintaining has been deleted and in its place the focal length of said lens in substantially constant relationship in spite of diametric thermal expansion, and for preventing said liquid from escaping from said volume, and

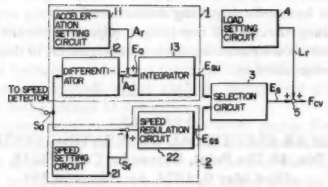
means for heating a fluid by means of solar energy passing through said lens.

3,965,684

DEVICE FOR CONTROLLING SPEED OF TURBINE

Masahide Nomura, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 21, 1975, Ser. No. 542,822
Claims priority, application Japan, Jan. 23, 1974, 49-9311
Int. Cl.² F01K 13/02
U.S. Cl. 60—660 11 Claims



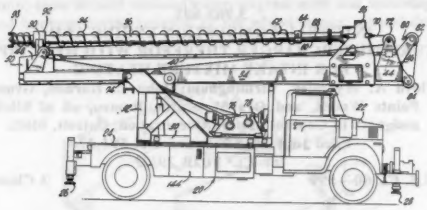
1. A device for controlling the speed of a turbine, comprising a constant speed control device which receives the output of a detector for detecting the speed of the turbine and a preset turbine speed signal so as to adjust the speed of the turbine to a predetermined value; an acceleration control device which receives the output of said detector and a preset turbine acceleration signal so as to adjust the acceleration of the turbine to a predetermined value; an adjustable valve provided at the entrance of said turbine; a selection circuit which receives the outputs of said constant speed and said acceleration control devices and selects one of said outputs which makes the opening of said adjustable valve smaller; and a means for determining the opening of said valve according to the output of said selection circuit, wherein the speed regulation circuit for determining the rate of change in the turbine output with respect to the turbine speed is provided in such a place that the change in the speed regulation affects only the constant speed control system consisting of said constant speed control device, said selection circuit, said valve-opening determining means, said adjustable valve and said speed detector.

3,965,685

METHOD FOR LOWERING GROUND WATER

Anthony J. D'Amiano, 5881 SW. 8th St., Plantation, Fla. 33314

Filed Sept. 25, 1974, Ser. No. 509,241
Int. Cl.² E02B 11/00
U.S. Cl. 61—11 2 Claims



1. A method of lowering ground water including:

a. providing a hollow auger having an openable tip,

b. drilling a hole in the ground using said auger,

c. lifting the auger slightly from the bottom of the formed hole in the ground after reaching a predetermined depth,

d. inserting a prepacked well point downwardly through the hollow auger and the openable tip, said prepacked well point including a hollow tube having perforations only at a closed bottom end thereof, a filter medium around said tube and a screen member around said filter medium,

e. lifting the hollow auger out of the hole leaving the prepacked well point in the ground,

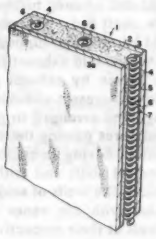
f. coupling the hollow tube to a vacuum source for removing water from the ground after the auger has been removed, whereby the vacuum source causes the water in the ground to pass through the said screen member, flow through the filter medium and enter the said hollow tube.

3,965,686

DRAIN SHEET MATERIAL

Jiro Saito, Tokyo; Kaoru Kimura, Iruma; Hiroshi Kusuhara, and Kazuyoshi Nakaguma, both of Tokyo, all of Japan, assignors to Ohbayashi-Gumi, Ltd., Osaka and Japan Vilene Company, Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 489,047, July 16, 1974, abandoned.
This application Sept. 22, 1975, Ser. No. 615,707
Claims priority, application Japan, Mar. 4, 1974, 49-25049
Int. Cl.² E02B 11/00
U.S. Cl. 61—11 2 Claims



1. A drain sheet element comprising:

a non-woven fabric layer of coarse and thick structure formed of synthetic fibers of relatively high denier randomly interconnected mainly at their cross points;

a plurality of elastic spiral springs linearly and parallelly positioned and embedded in the lengthwise direction of said fabric layer; and

two non-woven fabric layers of dense and thin structure, one each entirely attached to and entirely covering opposite surfaces of said coarse and thick fabric layer, each of

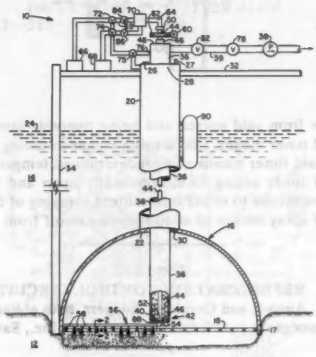
said dense and thin non-woven fabric layers being formed of randomly interconnected man-made fibers of relatively low denier.

3,965,687

APPARATUS FOR ANCHORING A STRUCTURE TO THE FLOOR OF A BODY OF WATER

Clarence W. Shaw, Metairie, La., assignor to J. Ray McDermott & Co., Inc., New Orleans, La.

Filed Aug. 15, 1974, Ser. No. 497,629
Int. Cl.² E02D 7/24, 27/52
U.S. Cl. 61—46 8 Claims



1. Apparatus for anchoring a structure to the floor of a body of water comprising:

a generally dome-shaped chamber having an open bottom and constructed of a fluid impermeable structural material which is non-collapsible under a pressure differential created when a suction is applied to the inside of said chamber;

a tubular caisson member fixedly attached to a top portion of the chamber and extending therefrom to a point above the surface of the body of water;

a plurality of fluid jet nozzles rotatably mounted in said chamber and aligned with the axis of said caisson member to direct a plurality of fluid jets generally in a direction of the open bottom of said chamber and generally perpendicular thereto;

displacement means operable when pressurized fluid is emitted from the nozzles for moving said nozzles with respect to said chamber and in a plane generally parallel to a plane of the floor of the body of water to slurry a portion of the unstable mud on the floor of the body of water lying beneath said open bottom and provide a zone of the floor into which said shell may penetrate;

a discharge conduit disposed within said caisson member for removing the slurried material from within the chamber;

a grate extending across the entirety of the open bottom of the chamber and having openings such that said grate acts in cooperation with said displacement means to filter and break apart slurried material entering said chamber to prevent clogging of said conduit while at the same time acting to prevent the chamber from penetrating into the floor before the entire zone beneath said chamber has been slurried; and

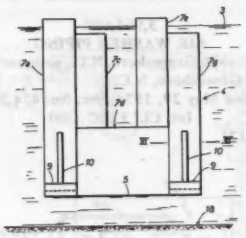
evacuation means for selectively evacuating said chamber to provide a differential pressure between said chamber and the surrounding body of water to urge said chamber towards the floor of the body of water.

3,965,688

UNDERWATER STRUCTURES, IN PARTICULAR FOR UNDERWATER DRILLING OPERATIONS

Peter Jensen, Boulogne, France, assignor to C. G. Doris, Paris, France

Filed July 24, 1974, Ser. No. 491,570
Claims priority, application France, July 25, 1973, 73.27245
Int. Cl.² E02D 27/00
U.S. Cl. 61—50 9 Claims



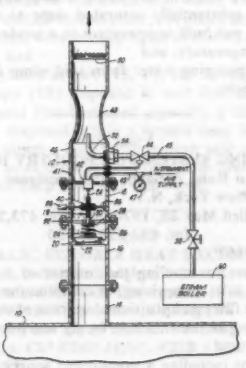
1. A structure designed to rest sunken upon the bed of a body of water in order to support on said bed fixed installations such as an off-shore drilling platform, comprising a vertical inwardly water-wetted internal wall defining a water-flooded central cavity having an open upper end and an open lower end, an outwardly water-wetted external wall defining a space between the external wall and the internal wall, a plurality of partitions extending vertically in said space to define a plurality of compartments therein and including a plurality of wall members projecting above said internal and external walls to form a plurality of hollow pillars uprising from said bed for supporting said fixed installations on said bed, and a plurality of base walls bottoming at least some of said compartments.

3,965,689

VENTING OF CRYOGENIC STORAGE TANKS

Lester E. Brown, and Harry H. West, both of Norman, Okla., assignors to University Engineers, Inc., Norman, Okla.

Filed July 18, 1974, Ser. No. 489,936
Int. Cl.² F17C 7/02
U.S. Cl. 62—50 14 Claims

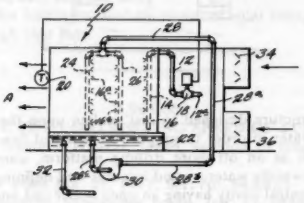


1. Apparatus for discharging cold, relatively dense gases to the atmosphere at a location near ground level comprising:

a vent pipe;

a Venturi ejection throat in said vent pipe;
a safety pressure relief valve spaced in the vent pipe from the Venturi ejection throat;
nozzle means in the vent pipe positioned to discharge a warming gas into a vented gas passing through the vent pipe along a path traversing the pressure relief valve and the Venturi ejection throat; and
means connected to said nozzle means and exterior of the vent pipe for supplying a warming gas to said nozzle means.

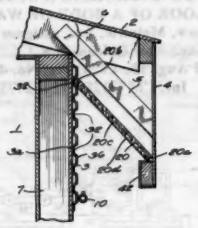
3,965,690
AIR WASHER PIPING
Robert A. Berryhill, Greensboro, N.C., assignor to Austin-Berryhill, Inc., Greensboro, N.C.
Filed May 29, 1974, Ser. No. 474,336
Int. Cl.² F28C 1/00
U.S. Cl. 62—121 **8 Claims**



1. An air washer for maintaining a substantially constant year-around dewpoint of air passing from the leaving side of the air washer comprising:
a first chilled water spray means for initially contacting air passing through the washer, said first spray means cooling the air to a desired wet bulb temperature;
a sump for receiving water from said spray means after said water from said spray means has passed through said air;
thermostat means located at the leaving side of the air washer for controlling the temperature of the water in said sump;
second spray means for contacting the air after the air has passed from said first spray means, the water passing through said second spray means being at the temperature of the water in said sump to cool and humidify the air to a substantially saturated state at a substantially constant wet bulb temperature to a predetermined dewpoint temperature; and
means for pumping water from said sump to said second spray means.

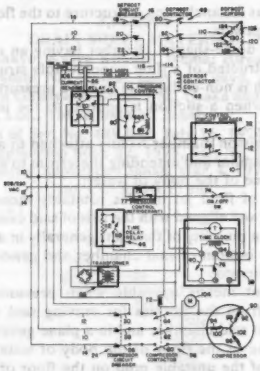
3,965,691
COOLING SYSTEM FOR POULTRY HOUSES
Robert L. Van Huis, Zeeland, Mich., assignor to U.S. Industries, Inc., New York, N.Y.
Filed May 28, 1974, Ser. No. 473,789
Int. Cl.² F28D 5/00
U.S. Cl. 62—157 **11 Claims**

1. Apparatus for cooling the interior of a poultry house having an air inlet comprising, in combination:
at least one filter pad positioned in front of the air inlet, said pad having an internal face facing said inlet and an external face; and
spray means including a pressurized source of coolant for spraying liquid coolant over said external face, said spray means positioned upstream of all said filter pads and directing said liquid coolant in the direction of flow through said air inlet whereby the air drawn through said pad is cooled;
automatic control means to initiate intermittent dispersement of the coolant onto said filter pad by said spray means, said automatic control means including temperature sensing means, timer means responsive to said temperature sensing means, valve means acting to control



flow from said source and being operably connected to said timer means, said sensing means initiating operation of said timer means at a predetermined temperature and said timer acting to intermittently open and close said valve means to effect intermittent spraying of coolant by said spray means so as to reduce run-off from said pad.

3,965,692
REFRIGERATION CONTROL CIRCUIT
Roger C. Ansted, and Gerald L. Rodgers, both of San Antonio, Tex., assignors to Friedrich Refrigerators Inc., San Antonio, Tex.
Filed Nov. 15, 1974, Ser. No. 524,131
Int. Cl.² F25D 21/08
U.S. Cl. 62—193 **18 Claims**



1. Control circuitry for a refrigeration unit comprising:
a source of power;
control switches for turning on said source of power;
compressor means connected to said source of power, said compressor means pressurizing a refrigerant for cooling said refrigeration unit;
defrost means connected to said source of power for defrosting said refrigeration unit;
means for periodically disconnecting said compressor means from said source of power and connecting said defrost means to said source of power;
means for sensing current flow through said defrost means and said compressor means, said current sensing means actuating said disconnecting means upon completion of defrost to reconnect said compressor means to said

source of power and to disconnect said defrost means from said source of power; and

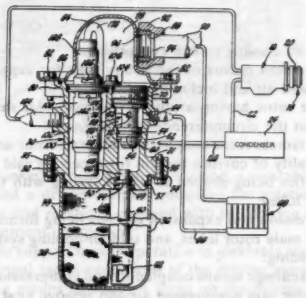
oil pressure control means associated with said compressor means and connected to said source of power for terminating power to said compressor means if oil pressure is reduced below a predetermined point for a specified period of time.

3,965,693

MODULATED THROTTLING VALVE

Richard E. Widdowson, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 2, 1975, Ser. No. 574,041
Int. Cl.² F16K *31/12*; F25B *41/04*
U.S. Cl. 62—217 4 Claims



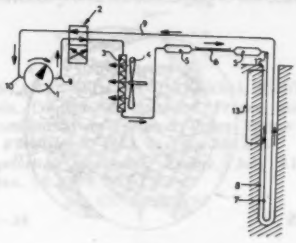
1. A suction throttling valve for regulating the pressure conditions within an evaporator unit of an automobile air conditioning system wherein the evaporator unit is connected in refrigerant flow relationship with a condenser, expansion means and an engine driven compressor comprising: a housing having an inlet and an outlet connected respectively to the evaporator and the compressor; a flow throttling assembly supported in said housing between said inlet and outlet for controlling the discharge of refrigerant from said evaporator so as to maintain the evaporator internal pressure above a level corresponding to frost forming conditions thereon; said flow throttling assembly including a body having a bore therein in which is reciprocally supported a piston valve whose movements cover and uncover a port in said body thereby controlling refrigerant flow; one side of said piston valve being fluidly exposed to evaporator refrigerant and a pressure control chamber formed on the opposite side of said piston valve; means to maintain a relatively constant pressure in said control chamber whereby a pressure differential across said piston valve produces a net force thereon to position the piston valve and thus regulate evaporator pressure by controlling the discharge of refrigerant through said port; means including a second piston reciprocal against a spring in response to decreasing refrigerant pressure downstream from said port to impose a supplementary closing force on said piston valve to permit evaporator pressure acting on said one side of the piston valve to increase substantially by reduced flow past said piston valve and through said port whereby the desirable consequence of reduced refrigerant flow to the compressor is decreased energy input.

3,965,694

METHOD AND DEVICE FOR THERMALLY AIR-CONDITIONING A ROOM, A VAT OR THE LIKE

Maurice Vignal, Faubourg Constant, and Henri Chapuis, Boulevard de Vinols, both of Craponne-sur-Arzon (Haute-Loire), France

Filed June 12, 1974, Ser. No. 478,495
Claims priority, application France, July 4, 1973, 73.25143; Mar. 28, 1974, 74.11887
Int. Cl.² F25D *23/12*
U.S. Cl. 62—260 7 Claims



1. An air-conditioning device constituted by a heat pump working between the atmosphere of a room or vat to be air-conditioned and the interior of a first hole bored in the ground, characterized in that said heat pump comprises the following members, which are inserted in a first closed circuit wherein a fluid circulates in its liquid state and its gaseous state:

a. a compressor (1) which receives the fluid as a cold gas, and delivers it as a hot gas;

b. a two position reversing valve (2) connected to said first closed circuit such that it reverses the flow of gas through the circuit as it moves from a first to a second position to allow the device to function either as a heating system or a refrigerating system;

c. an exchanger, (3) connected to said first closed circuit into which the gaseous fluid flows at a certain temperature and out of which it flows at a different temperature, said exchanger being thermally steeped in the atmosphere of the room to be air-conditioned;

d. a capillary tube (6), wherein the fluid circulates to pass from its liquid state to its gaseous state, or conversely;

e. a first U-shaped line or pipe (7) housed inside a first deep hole (8) bored in the earth, and inside which the fluid flows at a certain temperature, circulates and flows out at a temperature substantially equal to that which prevails in said hole; and

f. a second closed circuit (15, 17, 18) having a second U-shaped pipe (15) disposed in said first deep hole (8) adjacent said first U-shaped pipe (7), a third U-shaped pipe (18) disposed within a second deep hole (19) and means to pump a fluid (17) through said second closed circuit so as to transfer heat from said first deep hole to said second deep hole and vice versa.

3,965,695

METALLIC SENSIBLE HEAT EXCHANGER

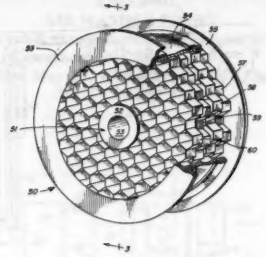
William F. Rush, Arlington Heights; Robert A. Macriss, Deerfield, and Sanford A. Weil, Chicago, all of Ill., assignors to Gas Developments Corporation, Chicago, Ill.

Filed June 12, 1975, Ser. No. 586,243
Int. Cl.² F28D *19/00*; F25B *13/00*
U.S. Cl. 62—271 10 Claims

1. An improved metallic heat exchange apparatus for use in cyclic heat exchange comprising multi-layers of metallic honeycomb each of said layers having axially parallel offset apertures and in just touching point contact with adjacent layers and retaining means for maintaining said relationship of said

honeycomb layers, said multi-layer arrangement providing increased temperature gradient between the outer faces of said multi-layers.

6. In an open-cycle air conditioning apparatus for heating and cooling of the type comprising an enclosure defining a treatment air passageway and a separate regenerative air passageway, means for passing an air stream through each of said passageways, a sensible heat exchanger means for transfer of thermal energy from one of said passageways to the other, a desiccant means for transfer of moisture from the air treatment passageway to the regenerative air passageway and spaced toward the exhaust of the regenerative air stream from



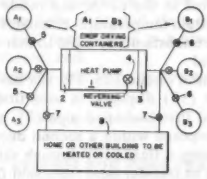
said heat exchanger means, a first evaporative cooling means near the exit of the conditioned air passageway and a second evaporative cooling means near the entrance of the regenerative air passageway, heater means in the regenerative air passageway between said sensible heat exchanger means and said desiccant means supplying heat to the regenerative air stream, the improvement wherein said sensible heat exchange means comprises multi-layers of metallic honeycomb, each of said layers having axially parallel offset apertures and in just touching point contact with adjacent layers and retaining means for maintaining said relationship of said honeycomb layers, said multi-layer arrangement providing increased temperature gradient between the outer faces of said multi-layers.

3,965,696

CROP DRYING (FOOD PRESERVING) APPARATUS

Harry Emmitte Thomason, 6802 Walker Mill Road, SE., Washington, D.C. 20027

Filed Dec. 21, 1973, Ser. No. 427,313
Int. Cl.² F25J *3/02*
U.S. Cl. 62—324 **9 Claims**



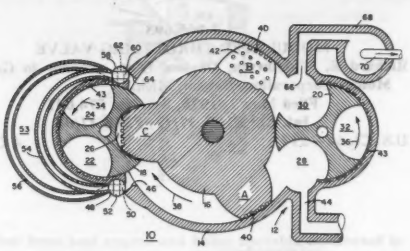
1. Apparatus for preserving perishables comprising a heat pump for producing both heat and cold, means for supplying heat from said heat pump to a first container to preserve the contents therein, means for supplying cold from said heat pump to a second container to preserve the contents therein, and means for switching the heat and cold supplies to supply cold to said first container and heat to said second container to thereby preserve said perishables by alternate heating and cooling and to conserve energy by using both the heat and cold outputs of the heat pump to preserve perishables, the duration of time after which the switching takes place being such that the temperature of the perishables in the second container is effectively raised and the temperature of the perishables in the first container is effectively lowered.

3,965,697

COMPRESSOR AND AIR COOLING SYSTEM EMPLOYING SAME

Richard R. Beierwaltes, 513 N. 4th Ave., Maywood, Ill. 60153

Continuation-in-part of Ser. No. 451,139, March 14, 1974, abandoned. This application Nov. 8, 1974, Ser. No. 522,028
Int. Cl.² F25D *9/00*
U.S. Cl. 62—402 **9 Claims**



1. An air cooling system comprising:

compression means of the rotary type for supplying compressed air and including:

a male rotor having a plurality of cycloidal shaped lobes about the circumference of said rotor;

a first female rotor coupled to said male rotor and having a plurality of cavities therein for receiving said lobes, said cavities being shaped to effect sealing with the sides of said lobes;

compression and expansion cavities being formed between said male rotor lobes, and said air cooling system further including:

heat exchange means coupled to said compression means to receive said compressed air and remove heat therefrom; and

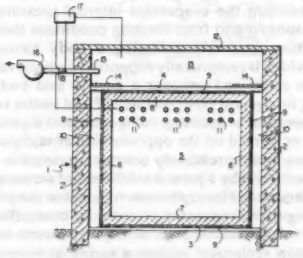
coupling means for coupling the compressed air from said heat exchange means to said expansion cavity where the compressed air is allowed to expand and cool, and for coupling the compressed air from said compression cavity to said heat exchange means.

3,965,698

REFRIGERATED STRUCTURE

Egbert deVries, Kettering, Ohio, assignor to Quad Corporation, Highland Park, Ill.

Filed Apr. 1, 1975, Ser. No. 563,981
Int. Cl.² F25D *19/00*
U.S. Cl. 62—454 **2 Claims**



1. In a refrigeration or freezer chamber having insulated walls, ceiling and floor including vapor barriers and located within a building having outer walls and a roof, a crawl space between the ceiling and the roof, the insulated walls spaced a relatively small distance from the outer walls to form an air

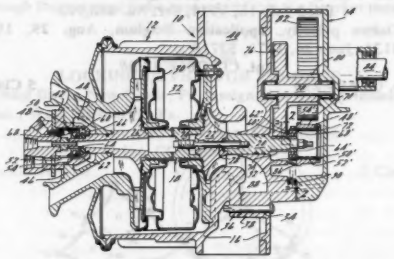
space, and wherein air pressure in the chamber at the upper portion near the ceiling is less than atmospheric pressure; the improvement comprising an air exhaust means to maintain a subatmospheric pressure within the said crawl space and within at least the upper portion of said air space.

3,965,699

SPRING COMPENSATED RADIALLY FLEXIBLE POWER TAKEOFF SHAFT

Joseph W. Bracken, Jr., Redford Township, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 29, 1974, Ser. No. 518,678
Int. Cl.² F16C *1/00*
U.S. Cl. 64—1 V **14 Claims**



1. In a transmission including a housing, a rotatable driving member, and a driven member mounted for rotation within the housing and rotatably engaged with the driving member; the improvement comprising:

A. flexible support means operative to yieldably resist omni-directional radial excursions of the driving member; and

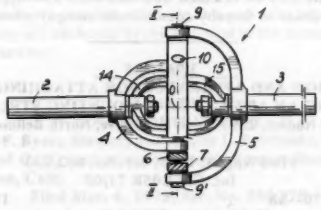
B. biasing means imposing a force on the driving member supplemental to the resisting force exerted by the flexible support means and acting in a direction parallel to the line of action of the rotative reactive forces of the driving and driven members and opposite to the direction of the rotative operative force exerted by the driven member on the driving member.

3,965,700

DRIVE LINE COUPLING DEVICE WITH SUBSTANTIALLY HOMOKINETIC FEATURES

Emilio Nicoletti, Via pietro Kandler, 7, Trieste, Italy (34100)

Filed Nov. 11, 1974, Ser. No. 522,804
Int. Cl.² F16D *3/42*
U.S. Cl. 64—18 **3 Claims**



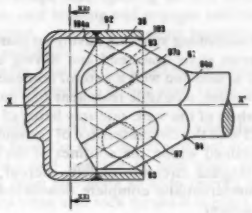
1. A substantially homokinetic universal joint drive line coupling device comprising: a drive shaft and a driven shaft, two yokes each of said yokes being rigidly affixed to one of said shafts and pivotally engaging a respective gimbal ring at a diameter thereof, both said gimbal rings being arranged concentrically while said pivot points are aligned to each other along a diameter when said two shafts are in line, two diametrically opposed pivot members pivotally engaging said two intervening concentric gimbal rings, said pivot members being arranged at approximately 45° to the diameter through said yoke pivot points, an auxiliary universal joint, concentric to said gimbal rings and idly engaging said two converging shafts, the spider of said supporting universal joint being mounted pivotally at a concentric diameter orthogonal to the diameter of said yoke pivot points through one of said gimbal rings while the auxiliary joint yoke, idly engaged onto the shaft, whose gimbal ring does not engage the spider, is at all times, when the shafts are in line, with its spider pivot points located on the same diameter as the pivot members joining the two rings, the universal joint axes converging in the center.

3,965,701

CONSTANT VELOCITY UNIVERSAL JOINTS

Michel Orain, Conflans-Ste.-Honorine, France, assignor to Societe Anonyme: Glaenzer Spicer, Poissy, France

Filed July 8, 1974, Ser. No. 486,655
Claims priority, application France, July 11, 1973, 73.25485; Jan. 28, 1974, 74.02774
Int. Cl.² F16D *3/30*
U.S. Cl. 64—21 **22 Claims**



1. A constant velocity ratio universal joint for transmission of rotational motion between two shafts adapted to run at a variable angle between one another, comprising two main parts each mounted for rotation with one of the shafts to be coupled, at least two pairs of balls for torque transmission between the main parts, each of said balls being guided along two associated arcuate cross-sections rolling surfaces each of which is provided on one of said main parts, said rolling surfaces being parts of surfaces of revolution, the cross-sections centerlines of which defining two associated guiding paths each of which being oriented to cut its associated guiding path at an angle of 2α and to make an angle α with the longitudinal axis of the shafts at the point of intersection between said associated guiding paths when said shafts are in alignment, each main part having one longitudinal plane of symmetry on both sides of which each guiding path for a given pair of balls is symmetrically located with a guiding path for the other pair of balls and vice versa, lines tangent to the guiding paths on one main part at the points of intersection of said guiding paths with their associated guiding paths on the other main part being parallel for a given pair of torque transmitting balls, characterized in that the axis of revolution of the rolling surfaces on each main part for a given pair of balls cut the longitudinal plane of symmetry of that main part, the points of intersection of said axis of revolution with said plane being located on a straight line passing through the longitudinal axis of said main part and equidistant with the point of intersection of said straight line with said longitudinal axis.

3,965,702

HOSIERY SUPPORT

Kurt Ernst Findeisen, Spring City, Pa., assignor to Findeisen Brothers, Spring City, Pa.

Filed Nov. 7, 1973, Ser. No. 413,677
Int. Cl. D04b 9/54; A41b 11/00
U.S. Cl. 66—173 2 Claims

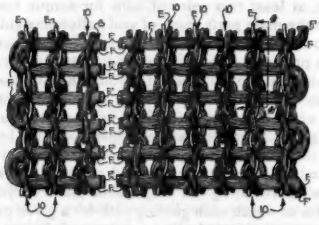
1. In a self-sustaining stocking having an elastic yarn knit in selected courses at its open end and having a small welt of double fabric at said end with a natural tendency to roll downwardly on a wearer, a flexible resisilient stay positioned within the double fabric of the welt, said stay being of a length which is less than 25% of the circumference of the said welt, said stay being unrestrained within the confines of the said welt such that is may migrate circumferentially thereof, said stay preventing circumferentially complete downward rolling of the welt on the wearer.

3,965,703

WARP KNITTED COMPRESSION BANDAGE FABRIC

J. David Barnhardt, Charlotte, N.C., assignor to Southern Webbing Mills, Greensboro, N.C.

Filed Apr. 18, 1975, Ser. No. 569,587
Int. Cl.² D04B 23/08
U.S. Cl. 66—193 7 Claims



1. A ribbon-like warp knitted compression bandage fabric, said bandage fabric being stretchable in the lengthwise direction, but substantially unstretchable in the widthwise direction, said bandage fabric comprising

a. a plurality of walewise parallel stitch loop chains knit of textured stretchable yarn within the range of about 100 to 300 denier and forming successive courses, said relaxed fabric containing from about 10 to 18 stitch loop chains per inch of width and containing at least about 30 courses per inch of length,

b. filling yarn extending back and forth across said fabric and being held in each of said courses of said stitch loop chains, said filling yarn being approximately 6 to 8 times larger than said stretchable yarn and being crimped and substantially unstretchable, and

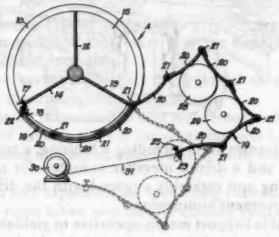
c. an elastic yarn within the range of about 140 to 240 denier and inlaid in and extending along pairs of adjacent parallel stitch loop chains, and being omitted from single stitch loop chains throughout the medial portion of said fabric.

3,965,704

DRUM FOR WASHER-EXTRACTOR MACHINES

Herman E-C Vanderheyden, Ledeberg, Belgium, assignor to Em. D'Hooge N.V., Ledeberg, Belgium

Filed July 16, 1974, Ser. No. 488,903
Claims priority, application Belgium, Aug. 29, 1973, 804131; June 26, 1974, 53710
Int. Cl.² D06F 37/08
U.S. Cl. 68—210 5 Claims



1. In a washer-extractor machine having a rotary drum, the improvement comprising:

said drum having a pair of end plates;

connecting means between said end plates, said connecting means being a plurality of radial partitions dividing said drum into outwardly open compartments; and

an outer shell extending completely around said drum over the outer edges of said partitions and closing all of said compartments, said shell consisting of a single series of panels having adjacent longitudinal edges hinged to each other, the first panel of said series being secured along one longitudinal edge to the outer edge of one of said partitions and the last panel of said series having locking means at its free edge releasably locking the same to the outer edge of said one partition whereby said locking means may be released and said shell unwrapped from said drum to thereby open all said compartments.

3,965,705

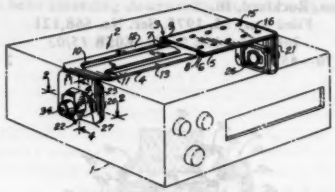
METHOD AND APPARATUS FOR ATTACHING AND LOCKING AN ARTICLE TO A MOUNTING STRUCTURE

Marshall Nadler, 2391 Knob Hill Drive, North Bellmore, N.Y. 11710

Filed Aug. 6, 1975, Ser. No. 602,833
Int. Cl.² E05B 73/00
U.S. Cl. 70—58 19 Claims

1. A device for attaching and locking an article to a mounting structure, said device comprising a locking means having locked and unlocked states, a support means supporting said locking means thereon for displacement between first and second positions corresponding respectively to said locked and unlocked states, said support means being adapted for attachment to an article, and bracket means adapted for attachment to a mounting structure, said bracket means having an aperture shaped to allow passage of said locking means therethrough such that in said locked state of the locking

means said locking means blocks removal thereof from said bracket means via said aperture, while in the unlocked state



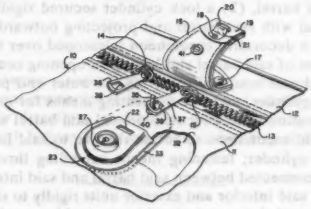
of the locking means said locking means can be passed through the aperture to be separated from the bracket means.

3,965,706

LOCKING DEVICE FOR LUGGAGE

Michael Davis, New Castle, Pa., assignor to Airway Industries Inc., West Pittsburgh, Pa.

Filed Nov. 25, 1974, Ser. No. 526,596
Int. Cl.² E05B *67/38*
U.S. Cl. 70—68 **3 Claims**



1. A locking device for a luggage case of the type having two parts joined by a separable fastener with a pair of sliders meeting in the closed position of the fastener, wherein the improvement comprises a flap anchored on one part of the luggage case and a lock member on the other part, the flap having thereon a latch which engages in the lock member to lock the parts of the luggage case against separation, a stud fixed in the wall of one of said parts of the luggage case laterally of the line of said separable fastener, to which the pull tabs of said sliders are adapted to be anchored to lock the separable fastener in closed position, said flap overlying said stud and having therein a hole which registers with said stud and through which the stud extends in the locked position of said flap thereby to prevent access to the pull tabs of the sliders while they are anchored to the said stud in the closed position of the fastener.

3,965,707

LOCKING STRUCTURE

Gordon F. Byars, Stanton, and Arthur L. Fairbanks, Fullerton, both of Calif., assignors to Security Storage Rentals, Inc., Stanton, Calif.

Filed Mar. 6, 1975, Ser. No. 555,970
Int. Cl.² E05B *63/14, 65/46*
U.S. Cl. 70—120 **3 Claims**

1. A locking structure for use with a door equipped with a latching member which is capable of being moved between a latched and an unlatched position which comprises:

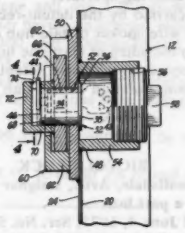
a control part secured to said latching member so as to extend therefrom adjacent to the rear surface of said door when said latching member is in said latched position,

said control part and said door being provided with openings which are aligned when said latching member is in said latched position and which are unaligned when said latching member is in said unlatched position,

a lock means having an elongated housing, a flange on one end of said housing and a movable retainer on the other end of said housing,

said lock means being capable of being actuated so that said retainer either extends from said other end of said housing or overlies said other end of said housing,

said openings and said lock means being of such a dimension that said lock means may be inserted through both of said openings so that said flange abuts against the front surface of said door,



said lock means being capable of being actuated when inserted through said opening so that said retainer extends from said housing and engages said control part so as to prevent relative movement between said control part and said door,

a plate forming a part of said locking structure secured to said door, said opening in said door being located in said plate,

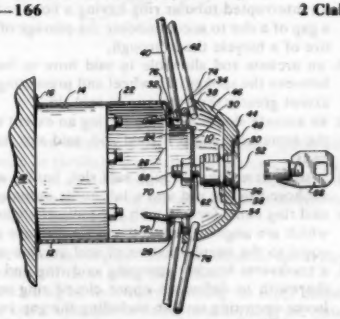
a shield located on said plate and extending from said plate outwardly from the front surface of said door, said shield surrounding said opening in said plate and extending outwardly from said plate so as to restrict access to said lock means when said lock means is in place in said opening in said plate and said control part.

3,965,708

HUB CAP LOCKING DEVICE

Don A. Smiley, 5340 W. Race, Chicago, Ill. 60644

Filed Dec. 5, 1974, Ser. No. 529,687
Int. Cl.² E05B *65/12*; B60B *7/06*
U.S. Cl. 70—166 **2 Claims**



1. A device for preventing the unauthorized removal of a wire-spoke hub cap, comprising, in combination:

a hub-covering shell having a cylindrical hub-engaging skirt and a head with a coupling aperture defined therein;

a crown cap including a curved radial skirt of a circumferential size and dimension for positioning the hub cap about said head adjacent said hub-covering shell and having a smooth exterior convex surface for preventing

removal of the crown cap with a wrench-like tools and defining a lock-engaging aperture;

elongated threaded locking means positioned within said lock-engaging aperture and rotatable in a first direction for threaded interlocking engagement with said coupling aperture to lock said hub cap, said elongated threaded locking means being rotatable in a second direction to permit removal of said hub cap;

manually-operable actuating means selectively insertable into cooperative interlocking engagement with said threaded locking means for rotation of the latter;

said hub-covering shell including a shoulder integrally connecting said radial skirt and the head and defining at least one detent-receiving aperture;

detent means carried by the detent-receiving aperture for abutting the wire spokes of said hub cap; and

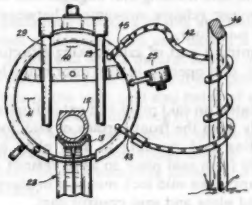
said crown cap including at least one lug abutting said wire spokes and operating with said detent means for substantially preventing rotation of said hub cap.

3,965,709

BICYCLE LOCK

Carl F. Belke, Scottsdale, Ariz., assignor to David P. Belke, Tucson, Ariz., a part interest

Filed June 4, 1975, Ser. No. 583,585
Int. Cl.[2] B62H *5/16;* **E05B** *71/00*
U.S. Cl. 70—227 **6 Claims**



1. In a bicycle lock for securing a wheel of the bicycle against rotation and preventing physical removal of the bicycle as an entirety,

a. an interrupted tubular ring having a bore and presenting a gap of a size to accommodate the passage of the rim and tire of a bicycle therethrough,

b. an arcuate rod slideable in said bore to be interposed between the spokes of a wheel and presenting a gap of an extent greater than the gap in said ring,

c. an arcuate slot in said ring having an extent substantially the same as the gap in said rod, said slot having closed ends,

d. a stem extending through said slot, having an inner end anchored to the rod and a tab on its outer end,

e. said ring being formed with two pairs of aligned apertures which are angularly spaced apart a distance substantially equal to the angular extent of said arcuate rod,

f. a transverse bracket spanning said ring and cooperating therewith to define an upper closed ring section and a lower open ring section including the gap in the ring,

g. a metallic line having one end permanently secured to said closed ring section and a loop at the other end which in a locked position of the ring, receives a part of the open section of the ring or that part of the rod which closes the gap, and

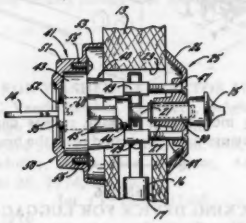
h. a padlock including a hasp which is adapted to be passed through either of said pair of aligned apertures to secure the ring in an adjusted position said hasp also being adapted to receive said loop at the end of said line.

3,965,710

DOOR LOCK WITH DECORATIVE ESCUTCHEON

Donald L. McCurdy, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Apr. 14, 1975, Ser. No. 568,121
Int. Cl.[2] A47B *95/04;* **E05B** *15/02*
U.S. Cl. 70—452 **2 Claims**



1. The combination of a lock and a door; said door having inner and outer sides and having a hole extending therethrough between said sides; said lock comprising an exterior unit for the outer side of said door and an interior unit for the inner side of said door; said exterior unit comprising (1) a cylindrical barrel, (2) a lock cylinder secured rigidly within and coaxial with said barrel and projecting outwardly therefrom, (3) a decorative escutcheon telescoped over the outer end portion of said barrel and having an opening coaxial with said barrel and rotatably receiving the outer end portion of said lock cylinder, and (4) connecting means for preventing axial separation of said escutcheon and said barrel while permitting said escutcheon to rotate relative to said barrel and said lock cylinder; fastening means extending through said hole and connected between said barrel and said interior unit to anchor said interior and exterior units rigidly to said door, and a key-and-slot connection between said escutcheon and said barrel for retaining said escutcheon in a predetermined angular orientation with respect to said lock cylinder, the key of said connection having less shear strength than said fastening means and shearing away when excessive torque is exerted on said escutcheon so as to enable said escutcheon to turn about the axis of said barrel and said lock cylinder and thereby prevent said excessive torque from being transmitted to said barrel and fracturing said fastening means.

3,965,711

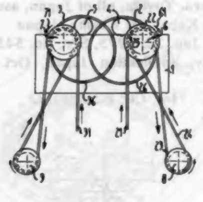
DEVICES FOR CONTINUOUSLY DISPLACING A FILAMENTARY MATERIAL IN A TREATMENT INSTALLATION

Marcel A. Giros, Ancerville, France, assignor to Societe Meusienne de Constructions Mecaniques, Ancerville (Meuse), France

Filed Jan. 8, 1975, Ser. No. 539,496
Claims priority, application France, Feb. 23, 1973, 73.07418
Int. Cl.[2] B21F *21/00, 3/02*
U.S. Cl. 72—39 **10 Claims**

1. In apparatus for treating flexible resilient filamentary material of indefinite length, a tank having a longitudinal horizontal axis extending from an entrance end to an exit end thereof, first and second shafts journaled over said tank for rotation about respective first and second axes spaced horizontally a predetermined distance and parallel with said longitudinal axis, first means guiding a first strand of material into said tank at the entrance end thereof to form a first helix comprising a multiplicity of axially-spaced loops each in contact with and supported by said first shaft with each loop passing adjacent and slightly spaced from said second shaft, second means guiding a second strand of material into said tank at the entrance end thereof to form a second helix com-

prising a multiplicity of axially-spaced loops each in contact with and supported by said second shaft with each loop passing adjacent and slightly spaced from said first shaft, each loop of each helix extending downwardly into said tank and inter-



calated between a consecutive pair of loops of the other helix, power means connected with said shafts and rotating the same in opposite directions, and means guiding in succession the loops of both helices out of said tank at the exit end thereof.

3,965,712

AQUEOUS BASE POST PICKLING AND COLD ROLLING FLUID

Ellis Abrams, Harleysville, and Sidney Barber, Philadelphia, both of Pa., assignors to E. F. Houghton and Company, Philadelphia, Pa.

Division of Ser. No. 569,662, April 21, 1975, Pat. No. 3,933,661. This application Oct. 22, 1975, Ser. No. 624,932
Int. Cl.² B21B *45/02*
U.S. Cl. 72—42 5 Claims

1. A process for producing steel sheet which comprises

A. applying to hot freshly pickled steel sheet an aqueous base post pickling fluid comprising

1. from about 85% to about 50%, by weight of water and from about 15% to about 50% of a concentrate comprising

a. from about 50% to about 92%, by weight, of a water miscible fluid which is the condensation product of an aliphatic monocarboxylic acid containing from 10 to 20 carbon atoms, or glyceride thereof, and a dialkanolamine selected from the group consisting of diethanolamine and diisopropanolamine, the mole ratio of dialkanolamine to carboxylic acid being not less than about 1.5 to 1

b. from about 8% to about 50% of an agent for reducing the viscosity of aqueous base lubricant compositions containing said concentrate, said viscosity reducing agent being selected from the group consisting of

i. a sulfonate of the general formula

$$RSO_3X$$

in which R is an alkyl arylene group containing from 20 to 30 carbon atoms and X is Na, K, NH_4 or an amino group

ii. a mono alkyl ether of a lower alkylene glycol of the formula

$$R'O(CH_2\underset{R''}{\underset{|}{C}}HO)_yOH$$

in which R' is an alkyl group containing from 1 to 4 carbon atoms, R'' is H or CH_3, and y is an integer of from 1 to 3

iii. a glycol selected from the group consisting of dipropylene glycol, tripropylene glycol, 1,5-pentane diol, 2-ethyl-1,3-hexane diol, and hexylene glycol,

iv. a monohydroxy oxyethylene oxy 1,2-propylene aliphatic monoether in which the ethylene oxide and 1,2-propylene oxide are combined therein as oxyethylene and oxy 1,2-propylene groups, said monoether having an average molecular weight of at least 300, and mixtures of said viscosity reducing agents, and

B. subsequently subjecting said steel sheet to cold rolling in the presence of an aqueous base rolling lubricant comprising

1. from about 99.5% to about 98%, by weight, of water and

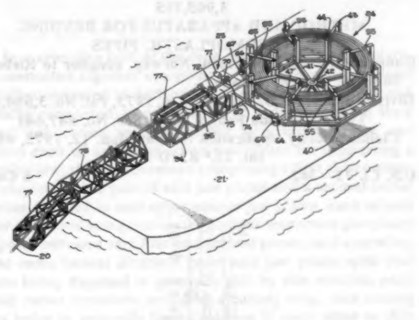
2. from about 0.5% to about 2% of said concentrate.

3,965,713

METHOD AND APPARATUS FOR LAYING CONTINUOUS PIPE

Edward E. Horton, Portuguese Bend, Calif., assignor to Deep Oil Technology, Inc., Long Beach, Calif.

Filed May 28, 1974, Ser. No. 473,568
Int. Cl.² B21D *11/06, 7/08*
U.S. Cl. 72—146 7 Claims



1. In a method of forming a flat annular pipe spiral unit which is stressed to facilitate unwinding of the unit by departure of pipe from the annular unit at a selected location with respect to the radius and axis of the unit and to maintain the unit in spiral form, the steps of:

providing a continuous pipe;

forming said continuous pipe into a flat annular spiral having a plurality of turns lying in a plane;

said turns including an inner turn defining the inner diameter of the spiral unit and an outer turn defining the outer diameter of said unit, and intermediate turns between said inner and outer turns,

each of said inner, outer, and intermediate turns being progressively bent about a radius which is the mean radius of the annular spiral unit,

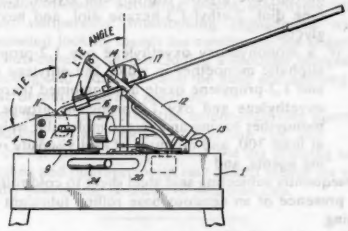
whereby bending stresses in said turns cause each of said turns to seek the radial position of the intermediate turn formed at the mean radius upon unwinding of said annular unit and to retain said flat spiral configuration.

3,965,714

GOLF CLUB BENDING MACHINE FOR SETTING THE LOFT AND LIE ANGLES OF THE CLUB HEAD

Franklin Beard, 14906 Cindywood, Houston, Tex. 77024

Filed Sept. 3, 1974, Ser. No. 502,970
Int. Cl.[2] B21D 7/14, 7/00
U.S. Cl. 72—32 7 Claims



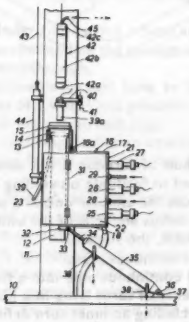
1. In a machine for adjusting the loft and lie angles of a golf club head, a base member, a clamp pivotally mounted on said base member, said clamp having certical walls, means for releasably anchoring a golf club head in vertical position in said clamp on said base member and releasably anchoring the hosel of said club in parallel alignment with the longitudinal walls of said base member, and means for selectively applying hydraulic pressure to cooperating members of said clamp to bend the neck of the club a predetermined distance to obtain the desired loft angle and to selectively move said means for anchoring said hosel to bend the neck of said club to the desired lie angle.

3,965,715

METHOD AND APPARATUS FOR BENDING THERMOPLASTIC PIPES

Gunnar Parmann, Mathopen, Norway, assignor to Rieber & Son A/S, Bergen, Norway

Division of Ser. No. 321,028, Jan. 4, 1973, Pat. No. 3,884,612.
This application Feb. 6, 1975, Ser. No. 547,441
Claims priority, application Norway, Jan. 12, 1972, 48/72
Int. Cl.[2] B21D 7/16
U.S. Cl. 72—342 6 Claims



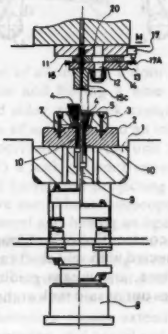
1. A heat chamber having means for seating a pipe therein in a predetermined position, said first means including a horizontal top member including a cavity corresponding to a curvilinear shape of a pipe at one end of said chamber adjacent said position to define a seat and a horizontal bottom member including a cavity corresponding to said shape at an opposite end of said chamber adjacent said position to define a seat, second means on one side of said chamber for directing at least one flow of heated air transversely onto and around a pipe in said position, an opening on an opposite side of said chamber from said one side for exhausting the heated flow of air passing away from said position, and a plurality of vertical side members secured to said top and bottom members, two of said side members projecting beyond the plane of said top and bottom members to define a whirl chamber adjacent said opening with a pipe in said position.

3,965,716

DEVICE FOR SWAGE-FORGING SHAFTS

Yoshikazu Suzuki, Chiryu; Katsumi Azuma, Okazaki, and Kiyoshi Ishimura, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jan. 22, 1975, Ser. No. 543,183
Claims priority, application Japan, Oct. 15, 1974, 49-118510
Int. Cl.[2] B21J 13/02
U.S. Cl. 72—356 9 Claims



1. Device for swage-forging a workpiece comprising a press having a vertically acting ram, said device comprising:
   a. a lower die set consisting of a die holder and a lower die on the bed of said press, said die holder having internal wall means at its center defining a first opening in which said lower die is fitted and means defining a second opening at one side thereof which extends to one side of said first opening and said lower die so as to permit horizontal insertion of the workpiece into said die, said lower die being divided into at least two parts which can slide up and down along said internal wall means and having a work-holding hole provided therebetween;
   b. a rotary die carrier attached to the ram of the press for rotation about a vertical axis and disposed above said lower die set;
   c. a plurality of upper dies attached to said rotary die carrier, and disposed upon said carrier so as to be alignable with said lower die, each upper die having a working surface shaped to carry out one step in finishing the workpiece;
   d. means for rotating said rotary die carrier; and
   e. means for stopping said carrier at each of a plurality of positions, in each of which one of said upper dies is in vertical alignment with said lower die.

3,965,717

METHOD FOR FORMING WOUND CIRCULAR MAGNETIC CORES INTO RECTANGULAR CORES

Howard S. Smith, Sharon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 10, 1975, Ser. No. 540,207
Int. Cl.[2] B21D 31/00
U.S. Cl. 72—364 1 Claim

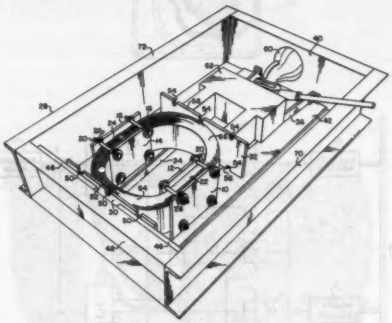
1. A method of forming a wound circular core having a

plurality of circular laminations into a rectangular core, comprising the steps of:

placing first, second, third and fourth end plates around opposite ends of all the circular laminations in the circular core;

tightening the first and second plates together and the third and fourth plates together to form two straight and parallel ends in the complete core;

inserting the complete core between two slotted side plates which are adjacent to the remaining curved portions of the core;



inserting a spacer block into the core window;

moving the side plates together to form a rectangular core;

aligning the slotted side plates during movement thereof by a pair of tracks engaged with slots in the side plates;

attaching means to the side plates to hold the side plates together after the force which moves the side plates together is released; and

annealing the core so that it will maintain its shape when the end and side plates are removed.

3,965,718

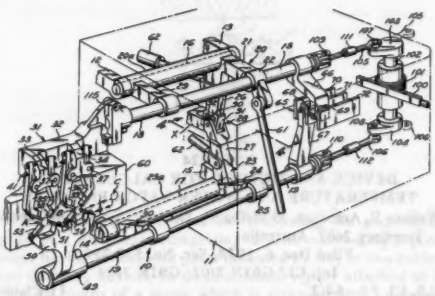
TRANSFER MECHANISM

Gaylen O. Kline, Tiffin, Ohio, assignor to The National Machinery Company, Tiffin, Ohio

Continuation-in-part of Ser. No. 381,851, July 23, 1973, abandoned. This application Nov. 18, 1974, Ser. No. 524,531

Int. Cl.[2] B21J *13/10*

U.S. Cl. 72—405 **31 Claims**



1. A transfer for forging machines or the like comprising a frame, a pair of opposed assemblies with each assembly including a support member pivoted on said frame for arcuate movement about a pivot axes parallel to the pivot axes of the other support member, an elongated arm mounted on each support member for lengthwise movement relative to its associated support member, each elongated arm having a cantilever end section, workpiece grippers mounted on the end sections operable to grip a workpiece at one transfer location and to transport such workpiece to another transfer location, and drive means operable to pivot said assemblies about their respective pivot axes to open and close said grippers and to produce lengthwise movement of said arms to move said grippers between said transfer locations, the direction of said lengthwise movement of said arms being parallel when said grippers are closed on a workpiece, the mounting of each elongated arm on its associated support being at a support location to one side of said transfer locations in the direction of the length of said elongated arms, and said cantilever end sections extending from said support location to said transfer locations.

3,965,719

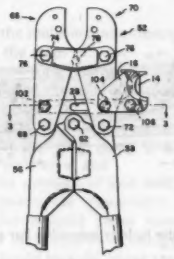
CUTTING ATTACHMENT FOR CRIMPING TOOL

Kenneth Scott Hays, Exton, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 11, 1974, Ser. No. 522,550

Int. Cl.[2] B21D *37/12*

U.S. Cl. 72—410 **6 Claims**



1. In a crimping tool of the type comprising handles pivotally connected together at a pivot, a pair of spaced jaw plates pivotally connected to each of said handles by a first pivot and pivotally connected to each other at a distance from their pivotal connection to said handles by a second pivot and wherein each of said pairs comprises means for supporting a crimping jaw, the improvement comprising a first cutter member coupled to one pair of said jaw plates and a second cutter member coupled to said other pair of jaw plates, each of said cutter members being connected to their respective jaw plates at a point between said first and second pivots, and extending in the same lateral direction from said jaw plates with said cutters being disposed in generally side by side relation, each of said cutter members including a cutting edge, said cutting edges being in generally facing relation to each other so that when said pairs of jaw plates are moved relative to each other about said second pivot said cutting edges move in said lateral direction toward each other to cut an item disposed therebetween.

3,965,720

HINGE ADJUSTMENT TOOL

Henderson R. Goodwin, Edenton, and Edwin G. Wall, Elizabeth City, both of N.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 28, 1975, Ser. No. 599,493

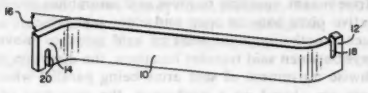
Int. Cl.[2] B21D *11/14*

U.S. Cl. 72—458 **2 Claims**

1. A hinge adjustment tool comprising:

a hot rolled steel bar having heat treatment hardened, opposite end portions projecting out of the plane of the intermediate portion in opposite directions and at an angle between 45° and 75°, said end portions being displaced to the angularly projecting positions by a cold bending oper-

ation, each end portion having a slot in one of its longitudinal edges, the slot in one end portion being open to one



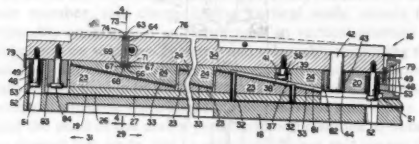
edge and the slot in the other end portion being open to the other edge.

3,965,721

ADJUSTABLE DIE HOLDER

Gerald V. Roch, Indianapolis, Ind., assignor to Hurco Manufacturing Company, Inc., Indianapolis, Ind.

Filed Feb. 24, 1975, Ser. No. 552,193
Int. Cl.² B21D 7/06
U.S. Cl. 72—462 **21 Claims**



1. An adjustable die holder assembly for a press brake or the like comprising:

a die holder frame receivable on a press brake bed;

elongated die holder means mounted in said frame and having means thereon for holding a die therein;

and height changing means cooperating with said holder means and frame and operable, when actuated, to change the height of said holder means with respect to said frame uniformly throughout the length of said holder means,

said holder means including a die holder bar; and

said height changing means including a plurality of wedge means in said frame and vertically supporting said holder bar, said wedge means including upper wedges secured to said holder bar and a wedge driver mounted in said frame, said wedge driver being operable longitudinally of the holder bar and frame assembly to drive the wedges vertically as a unit.

3,965,722

APPARATUS FOR THE MEASUREMENT OF VISCOSITY

Greville Euan Gordon Bagg, Waltham Abbey, and Robert Ian Cracknell, Hoddesdon, both of England, assignors to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 279,770, Aug. 11, 1972, abandoned. This application May 3, 1974, Ser. No. 466,892
Int. Cl.² G01N 11/16
U.S. Cl. 73—59 **6 Claims**

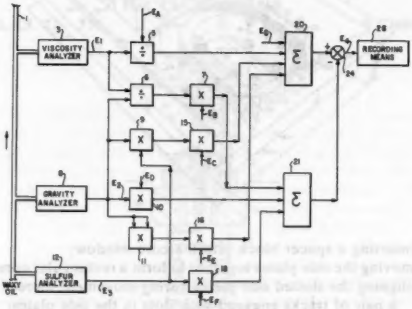
1. An apparatus for detecting a change in viscosity of a material, the change being from a highly fluid state to a high viscosity "set" state, comprising a probe, a motor for rotating said probe in a sample of the material, an operational amplifier having a negative feedback loop electrically connected to said motor, said amplifier providing current for driving said motor and said feedback loop compensating partially for the effect of increased loads on said motor, and means for measuring a parameter of the said combination, which parameter varies in accordance with the logarithm of the viscosity of said sample of material.

3,965,723

WAX CONTENT MEASURING MEANS

Charles W. Harrison, Nederland; Theodore C. Mead, Port Arthur; Howard R. Moreland, Houston, and Frank L. Barger, Port Arthur, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed May 8, 1975, Ser. No. 575,759
Int. Cl.² G01N 11/00, 33/26
U.S. Cl. 73—53 **5 Claims**



1. Means for determining the wax content of waxy oil, comprising means for sensing the viscosity of the waxy oil and providing a corresponding signal, means for sensing the gravity of the waxy oil and providing a signal corresponding thereto, means for sensing the sulfur content of the waxy oil and providing a signal representative thereof, means connected to all the sensing means for providing a signal corresponding to the wax content of the waxy oil in accordance with the sensed parameter signals.

3,965,724

DEVICE AND METHOD FOR CALCULATING TEMPERATURE AND WATER VAPOR PRESSURE

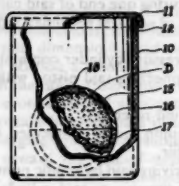
Wallace R. Ambrose, 39 Melba St., Downer, Australian Capital Territory 2602, Australia

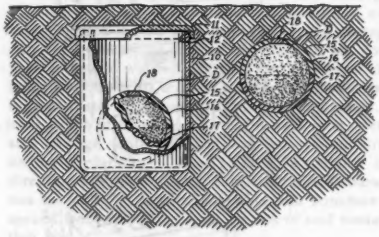
Filed Dec. 6, 1974, Ser. No. 530,292
Int. Cl.² G01N 5/02; G01K 3/04
U.S. Cl. 73—64.2 **11 Claims**

1. A device for use in determining the timetemperature history of a medium over a selected period of time, said device being in said medium at the time of measurement, such device comprising a fluid tight contaner, the interior of said container containing a hollow spherical cell of constant wall thickness, and permeable to water vapour, said cell containing a dry desiccant material in particulate form and said container being filled to capacity with water.

10. Apparatus for use in determining the vapour pressure

history of a medium over a selected time which comprises a device as claimed in claim 1 placed in close proximity to a





non-containerised hollow spherical cell containing a dry desiccant, both being situated in the medium.

3,965,725

SOUNDING VIBROMETER

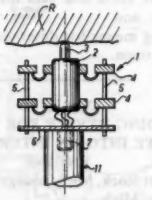
Philippe Weber, Fontainebleau, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Filed Aug. 14, 1974, Ser. No. 497,494

Claims priority, application France, Aug. 14, 1973, 73.29710

Int. Cl.² G01N 9/18; G01D 7/00

U.S. Cl. 73—71.4 **9 Claims**



1. A sounding vibrometer for measuring the particulate speed in a rock mass comprising: a sensor including a geophone having its test-lead point mounted by way of two cable-type damping devices on small columns rigidly attached to a plate by means of a screw which is screwed onto a tubular section of a zicral or fiber glass rod, the tubular section being connected to three other sections by means of three bayonet or automatic connections, and an electrical circuit comprising an input with a switch and damping shunt resistance, a low-pass filter, an adjustable gain amplifier, a rectifier, an analog-digital converter, and an integrator-indicator which indicates a number proportional to the integral of the modulus of the particulate speed of said rock mass as detected by the geophone during the duration of a vibration.

3,965,726

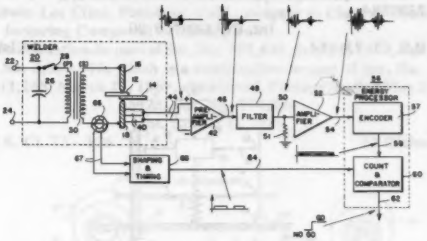
METHOD AND APPARATUS FOR THE REAL-TIME EVALUATION OF WELDS BY EMITTED STRESS WAVES

Sotirios John Vahaviolos, East Windsor Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed July 2, 1975, Ser. No. 592,437

Int. Cl.² G01N 29/00

U.S. Cl. 73—71.4 **10 Claims**



1. A method for the real-time, non-destructive evaluation of a weld comprising the steps of:

a. measuring stress-wave energy emitted by the material deformation during the solid-to-liquid phase transformation of the weld area;

b. measuring stress-wave energy emitted from cracks developing during the post-weld liquid-to-solid phase transformation of the weld area; and

c. determining the strength of said weld by measuring the difference between the stress-wave energy measured during the solid-to-liquid phase transformation of the weld area and the stress-wave energy measured during the post-weld liquid-to-solid phase transformation.

3,965,727

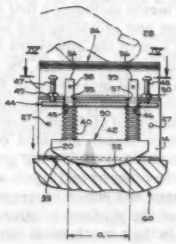
HARDNESS TESTING INSTRUMENT

George A. Argabrite, c/o Pacific Transducer Corporation, 2301 Federal Ave., Los Angeles, Calif. 90064

Filed Oct. 17, 1974, Ser. No. 515,654

Int. Cl.² G01N 3/48

U.S. Cl. 73—81 **6 Claims**



1. In an instrument for testing the hardness of a compressible sample and having a frame including means limiting downward movement of the frame relative to a sample and an indentor movably carried by the frame and resiliently biased downwardly relative thereto,

the improvement wherein the indentor comprises a thin elongated blade provided with a convex downwardly directed marking edge for penetrating a sample and including a pair of spaced legs fixed to the blade near opposite ends thereof and projecting upwardly therefrom, and a resilient member associated with each leg for providing said resilient bias.

3,965,728

APPARATUS FOR COMPENSATING MOVEMENTS OF AN APPARATUS FOR MEASURING OR RECORDING DISPLACEMENTS IN RESPECT OF A FIXED REFERENCE SURFACE

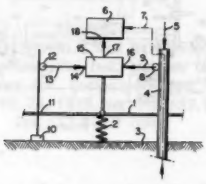
Arie Pieter van den Berg, Heerenveen, Netherlands, assignor to Ingenieursbureau A.P. van den Berg B.V., Heerenveen, Netherlands

Filed July 9, 1974, Ser. No. 486,870

Claims priority, application Netherlands, July 9, 1973, 7309584

Int. Cl.² G01N *3/00*

U.S. Cl. 73—84 9 Claims



1. In an apparatus for soil sounding which includes a movable probe supported on a platform of a vehicle which in turn is resiliently supported on the ground wherein the probe is moved downwardly relative to the platform and wherein the platform forms a reference surface, and wherein there is an upward displacement of the reference surface relative to the ground during downward movement of the probe and wherein the position of the probe is monitored by sensor means supported on the platform of said vehicle and movable upwardly therewith in response to upward displacement of the vehicle platform, said sensor means cooperating with the probe and wherein the displacement of the reference surface from the ground creates errors in determining accurately the position of the probe which is movable in a nonuniform manner, the improvement comprising:

means mounted on said vehicle to measure the displacement of the reference surface relative to the ground, said means including:

a. subtractor means mounted on said vehicle and having a first and second input and an output;

b. said sensor means including a first sensor supported on said platform and providing one of said inputs, which input is the sum of the downward displacement movement of said probe relative to the ground and the upward displacement movement of the vehicle platform relative to the ground, said input being greater than the actual displacement of the probe relative to the ground;

c. further sensor means mounted on said vehicle and including means contacting the ground and operative to provide the other of said inputs which is smaller than said one input and which is representative of the displacement of the platform relative to the ground; and

said subtractor being a mechanical subtractor operative to subtract from the input which is greater than the actual displacement of the probe the input representative of the displacement of the reference surface relative to the ground.

3,965,729

LOAD CRACK TESTING DEVICE

William E. King, Jr., Bowie, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 1, 1975, Ser. No. 618,727

Int. Cl.² G01N *3/10*

U.S. Cl. 73—90 4 Claims

1. A sustained constant load cantilever loading type specimen testing system; which comprises

a support

means on said support for anchoring one end of a test specimen in place,

a cantilever

means for securing one end of said cantilever and the unanchored end of said test specimen rigidly together in linear alignment,

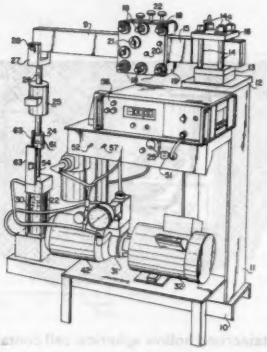
a hydraulic pressure cylinder containing a piston therein,

means for connecting said piston with the free end of said cantilever,

a hydraulic fluid reservoir

a hydraulic pump means connected to receive fluid from said reservoir,

a motor for driving said hydraulic pump to supply hydraulic fluid under pressure to said cylinder,



a subplate with interconnected stacked valves connected therewith

said valves including in succession a relief valve, a flow control valve and a directional fluid flow valve,

said subplate and said stacked valves including sufficient interconnecting fluid pressure lines therethrough to control fluid flow under pressure from said hydraulic pump through said relief valve, said flow control valve and said directional fluid flow valve to said cylinder and sufficient interconnecting return lines to return fluid from said pressure relief valve and said directional flow valve to said reservoir, and

a load indicating means for determining stress or strain on said test specimen.

3,965,730

VORTEX SHEDDING DEVICE FOR USE IN MEASURING AIR FLOW RATE INTO AN INTERNAL COMBUSTION ENGINE

Gary L. Innes, Flat Rock, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 28, 1975, Ser. No. 572,606

Int. Cl.² G01M *17/00*; G01F *1/32*

U.S. Cl. 73—118 2 Claims

1. A vortex shedding device for use in measuring the rate at

which air flows into the air intake of an internal combustion engine, said device comprising:

a conduit having a passage within it through which air whose flow rate is to be measured may flow, said passage having a venturi section formed in it, said venturi section being of rectangular cross-section throughout and having width and height dimensions, the width dimension being the greater of said dimensions, said venturi section including an inlet portion a throat portion having a cross-sectional area in the range from about one-third to about one-half of the cross-sectional area of said inlet portion, a converging portion between said inlet and throat portions, and a diverging portion extending away from said throat portion toward the end of said passage remote from said inlet portion, said converging and diverging portions being formed by variation of said height dimension, said width dimension being constant over the length of said venturi section,

an elongated element for generating vortices in air flowing in said passage in a direction from said inlet portion toward said diverging portion, said elongated element being located in said throat portion of said passage and extending transverse to said direction of air flow and parallel to said width dimension, said elongated element being of circular or semi-circular cross-section and having a diameter in the range from about 1.5 mm to 3.5 mm,

a honeycomb structure positioned in said inlet portion of said passage venturi section, said honeycomb structure having a plurality of flow channels extending in said direction of said air flow to impart stratified characteristics to such air flow, said honeycomb structure being spaced from said converging portion of said venturi section, and

said cross-sectional area of said throat portion being sized, relative to said internal combustion engine, to achieve a maximum flow velocity in said throat portion in the range from about 76 to about 92 m/sec.

3,965,731

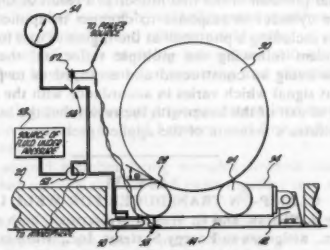
ROLLER BRAKE TESTER

Carl Junior Asmus, Temple City, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.

Filed Dec. 16, 1974, Ser. No. 532,817

Int. Cl.² G01L *5/28*

U.S. Cl. 73—126 **12 Claims**



1. In a roller brake tester for testing a pair of wheel brakes of a motor vehicle, the combination which comprises:

wheel support means including a frame and pair of aligned rear cradling rollers and a pair of aligned front cradling rollers mounted in the frame for supporting and rotating the pair of vehicle wheels, the rear cradling rollers being arranged to engage the rear portion of the wheels, and the front cradling rollers being arranged to engage the front portion of the wheels, the frame being pivotally mounted with respect to a support surface at a location between the front and rear cradling rollers; and

means for selectively raising and lowering the pair of rear cradling rollers relative to the front cradling rollers when a pair of vehicle wheels are positioned thereon to restrain the wheels from traveling back over the rear cradling rollers in their raised position and to permit the vehicle wheels to readily be driven off and on of the rear cradling rollers in their lowered position.

3,965,732

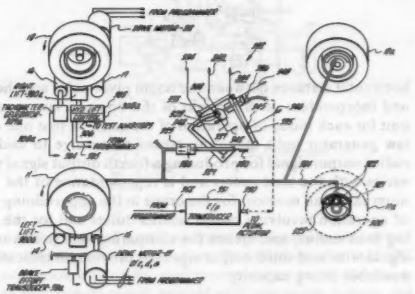
COMPUTER TYPE BRAKE ANALYZER

Edwin Lee Cline, Pasadena, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.

Continuation-in-part of Ser. No. 382,538, July 25, 1973, Pat. No. 3,899,916, which is a continuation-in-part of Ser. No. 811,168, March 27, 1969, abandoned. This application May 5, 1975, Ser. No. 574,284

Int. Cl.² G01L *5/28*

U.S. Cl. 73—126 **23 Claims**



1. In an apparatus for analyzing the braking performance of a wheeled vehicle having wheel brakes individually associated with at least two wheels and a brake actuator for simultaneously applying the brakes to said wheels, the combination which comprises:

test means for rotating said wheels of the vehicle;

brake effort signal generating means including the test means for producing a separate brake effort signal for each wheel, the brake effort signals being proportional to the brake effort of the respective wheel while the wheel brakes are being applied; and

system response signal generating means responsive to the brake effort signals and to the operation of the brake actuator for producing a brake system response signal proportional to the delay between the time that the brake actuator is operated and at least one of the wheel brakes reaches a preselected brake effort.

3,965,733

CRANE LOAD INIDICATING ARRANGEMENT

Bernard David Francis Hutchings, Chelmsford, and Robert William Hubbard, Southend-on-Sea, both of England, assignors to Pye Limited, Cambridge, England

Filed May 10, 1974, Ser. No. 468,764

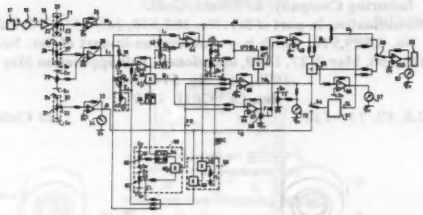
Claims priority, application United Kingdom, Mar. 15, 1973, 22500/73

Int. Cl.² B66C *13/16*

U.S. Cl. 73—133 R **20 Claims**

1. A load indicating arrangement for use with a crane or other lifting apparatus having a pivotally mounted telescoping boom comprising, boom supporting means, means for producing a first output signal representative of the total turning moment of the boom about its pivot in supporting a load, said first output signal producing means including transducer means for producing an output signal which is a function of the reaction sustained by the boom supporting means in supporting the boom and any bad suspended therefrom and angle

sensing means for modifying said output signal in accordance with the sine of the angle included between the boom supporting means and the boom, means for producing a second output signal representative of the turning moment of the boom about its pivot due to the weight of the boom alone, means for combining said first and second output signals to produce a third output signal which is the algebraic difference between said first and second output signals and which is thus representative of the turning moment due only to the load, means for deriving a load radius output signal representative of the



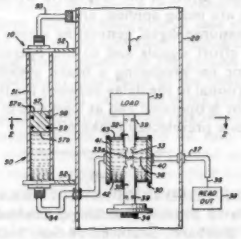
horizontal distance between the boom pivot point and the load and independent of the weight of the boom, a law generator unit for each mode of operation of the crane, a first one of the law generator units including means responsive to said load radius output signal for producing a fourth output signal which varies with the load radius and is representative of the maximum safe load moment for the crane in the appertaining mode of operation involving radius related duties and for the existing load radius, and means for comparing said fourth output signal with said third output signal to provide an indication of available lifting capacity.

3,965,734

PRESSURE EQUALIZING LOAD CELL SYSTEM

Howard E. Ward, Tustin, and Mari A. Wolf, El Toro, both of Calif., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Feb. 19, 1975, Ser. No. 551,226
Int. Cl.² G01L 1/26
U.S. Cl. 73—141 A **3 Claims**



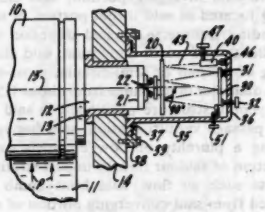
1. A load cell assembly comprising: an elongated load cell mounted within a fluid environment and having a force-sensing portion intermediate the ends thereof; enclosure means on said load cell spaced from and surrounding said force-sensing portion for forming a sealed enclosure therearound and containing a non-corrosive fluid therein; said enclosure means including at least one flexible diaphragm sealingly secured to said load cell for allowing slight relative movement between the ends of said load cell; and pressure equalizing means in fluid communication with such environment and the interior of said enclosure means for equalizing the pressure on each side of said diaphragm and for preventing the fluid of such environment from entering said enclosure means; said pressure equalizing means including an elongated chamber having a piston slidable therein forming within said elongated chamber two variable volume fluid chamber portions, a first pressure line communicating said non-corrosive fluid between said enclosure means and one of said chamber portions, a second pressure line communicating the fluid of such environment with the other of said chamber portions.

3,965,735

DEVICE FOR MEASURING PRESSURE BETWEEN CYLINDERS OF A PRINTING PRESS

Winfried Hartung, Offenbach am Main, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Filed Apr. 10, 1975, Ser. No. 566,749
Claims priority, application Germany, Apr. 10, 1974, 2417522
Int. Cl.² G01L 5/00
U.S. Cl. 73—141 A **14 Claims**



1. A device for measuring the pressure between two cylinders in a printing press frame along a common plane containing the two cylinders comprising, in combination, a cylinder having a pair of journals supported in respective bearings in the press frame, a first mirror fixed to the end of one of the journals perpendicularly to and centered upon the cylinder axis for rotation with the cylinder, a relatively stationary second mirror facing the first mirror, means for mounting the second mirror on the frame spaced substantially parallel to the first mirror, a light emitter at one edge of the mirrors and lying substantially in the common plane for directing a concentrated beam of light between the mirrors at a shallow angle of incidence for multiple reflection thereof with the point of exit of the beam of shifting in accordance with changes in the angular position of the first mirror as a result of slight bowing of the cylinder in response to changes in applied pressure, means including a photocell at the region of exit for receiving the beam following the multiple reflection, the photocell means being so constructed and arranged as to produce an output signal which varies in accordance with the shift in the point of exit of the beam with the result that the output signal constitutes a measure of the applied pressure.

3,965,736

CLAMP-ON TRANSDUCER FOR WELL UNIT

Barry S. Welton, and G. Wayne Westerman, both of Midland, Tex., assignors to Energy Systems, Inc., Midland, Tex.

Filed Feb. 13, 1974, Ser. No. 442,218
Int. Cl.² E21B 47/00
U.S. Cl. 73—151 **9 Claims**

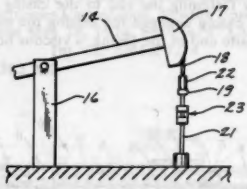
1. A strain measuring device for measuring the strain in the polish rod of a rod-pumped well unit having a reciprocal rod string extending to a subterranean producing formation and actuated by a prime mover comprising:

body means;

clamp means coupled to the body means, the clamp means being capable of detachably affixing the body means to the exterior of the polish rod of a well unit; and

transducer means attached to the body means and adapted to provide an indication of the strain induced in the polish rod during reciprocation thereof,

said body means comprising a split cylinder, and hinge pin means joining sections of said split cylinder, said clamp



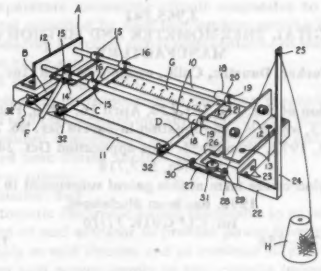
means being adapted to hold said split cylinder about a portion of the polish rod.

3,965,737

METHOD AND APPARATUS FOR INDICATING THE AMOUNT OF TORQUE IN A YARN

Hubert B. Matthews, 301 Lindsay Ave., Greenwood, S.C. 29646

Filed Feb. 13, 1975, Ser. No. 549,675
Int. Cl.² G01L *5/06*
U.S. Cl. 73—160 **10 Claims**



1. A device for indicating torque in a yarn comprising:
a. a support platform;
b. an elongated member mounted on said support platform;
c. a first member carried by said elongated member having means for receiving and clamping said yarn;
d. a second member movably carried on said elongated member having means for receiving and clamping said yarn;
e. tensioning means for applying a predetermined amount of tension to said yarn held between said first and second members;
f. said second member being movable towards said first member causing said yarn to twist together into a loop; and
g. means for indicating the point at which said loop occurs to indicate the amount of torque therein.

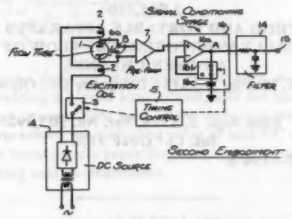
3,965,738

MAGNETIC FLOWMETER

Masayasu Watanabe, Yokohama, Japan, assignor to Hokushin Electric Works, Ltd., Tokyo, Japan

Filed July 29, 1974, Ser. No. 492,766
Claims priority, application Japan, July 31, 1973, 48-86612
Int. Cl.² G01F *1/58*
U.S. Cl. 73—194 EM **3 Claims**

1. In an electromagnetic flowmeter provided with a flow tube through which the fluid to be metered is conducted, the tube having a pair of electrodes mounted at diametrically-opposed positions and an excitation coil to produce a magnetic field in the tube which is transverse to the direction of the flow, the combination comprising:
A. a D-C power source connected to said coil,
B. a power switch interposed between said source and said coil to interrupt the flow of D-C thereto whereby during an excitation period in which D-C is applied, the output of the electrodes is the combined voltage of a live flow signal and a zero-point voltage induced in the liquid flowing in the tube, and during a non-excitation period in which DC is interrupted, the output is the zero-point voltage only,
C. means responsive to the action of said power switch to hold said zero point voltage produced during the non-excitation period,
D. means to subtract said held zero-point voltage from the combined voltage to produce an output voltage in which zero error is minimized, and



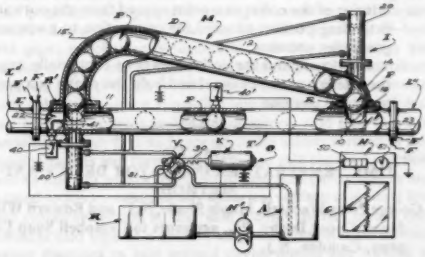
E. a timing control circuit operatively coupled to said switch to effect periodic operation thereof, whereby said DC excitation is periodic, said means responsive to the action of said power switch to hold said zero-point voltage and said means to subtract said held zero-point voltage from the combined voltage are constituted by a main differential amplifier whose non-inverting input is responsive to signals derived from the electrodes, the output of the amplifier being connected by a second switch during the non-excitation period to a capacitor whose charge represents said zero-point voltage, the zero-point voltage charge during the excitation period being transferred by said second switch to the inverting input whereby said amplifier subtracts the zero-point voltage from the combined voltage.

3,965,739

FLOW METER

Ray L. Jones, 258 Paseo de Granada, Redondo Beach, Calif. 90277

Filed May 13, 1975, Ser. No. 577,019
Int. Cl.² G01F *1/00*
U.S. Cl. 73—194 E **13 Claims**



1. An elongate fluid flow meter with upstream and downstream ends, comprising an elongate flow tube with upstream and downstream ends substantially coextensive with the meter means, means connecting the upstream and downstream ends

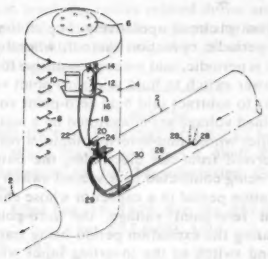
of the tube with upstream and downstream sections of a fluid line, an elongate transport duct at the exterior of the tube with upstream and downstream ends communicating with sides of the tube adjacent the upstream and downstream ends thereof; a plurality of plugs shiftable longitudinally in and through the duct and tube, intermittently operable plug engaging transfer means actuatable to synchronously transfer a plug transported through the duct to the end thereof into the tube and to transfer a plug transported through the tube to the downstream end thereof into the duct, control means for the transfer means comprising a plug sensing device at a predetermined position longitudinally of the tube, connected with the transfer means and operable to sense the presence of a plug in the tube at said position and cause the transfer means to actuate whereby plugs are transferred into and out of the upstream and downstream ends of the tube without substantially impeding of the flow of fluid through the tube and means to count and time intervals between plugs sensed by the device.

3,965,740

METHOD AND PORTABLE APPARATUS FOR CONTINUALLY MONITORING THE FLOW OF FLUID IN AN OPEN CHANNEL

Kenneth W. Martig, Jr., 2116 Lakemoor Dr., Olympia, Wash. 98502

Filed Sept. 5, 1974, Ser. No. 503,392
Int. Cl.² G01F 1/00
U.S. Cl. 73—194 R **5 Claims**



1. A probe for use in determining the depth of fluid in an open channel comprising:

a. expandible collar means comprising a band of an exterior configuration to substantially conform to the interior of the channel and of a width to substantially align itself so that its central axis is substantially parallel with the axis of the channel,

b. elongated probe means extending outwardly of the collar substantially parallel with the axis of the collar, said probe means secured to the collar means and conforming to the interior of the collar to a point spaced from the outwardly extending portion adapted for connection to a source of gas under pressure, and

c. means to expand the collar means to frictionally engage the interior of the channel and hold the probe in a predetermined position.

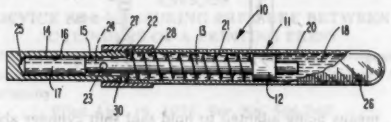
3,965,741

TIME TEMPERATURE INDICATOR DEVICE AND METHOD

George Peter Wachtell, Maple Shade, N.J., and Edward Wilred Jones, Upper Darby, Pa., assignors to Campbell Soup Company, Camden, N.J.

Filed May 8, 1975, Ser. No. 575,589
Int. Cl.² G01K 3/00, 11/06
U.S. Cl. 73—344 **12 Claims**

4. A temperature level detection device comprising a longitudinally disposed casing having a piston slidable for longitudinal movement therein, a rod carried by the piston extending into a well in a first end of the casing, a heat-responsive meltable substance of predetermined melting temperature in the well normally fastening the rod to the casing in the well, a spring in the casing engaged for biasing the piston toward a second, opposite end of the casing, a viscous liquid substance



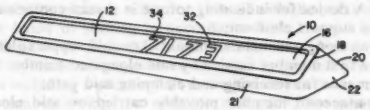
in said second end of the casing, passage means for traversal of the piston with the liquid, with the liquid having a viscosity that is substantially independent of temperature whereby a melted condition of said substance allows biased piston movement against said viscous liquid toward said second end of said casing, releasing the rod from its fastened position in the well.

3,965,742

DIGITAL THERMOMETER AND METHOD OF MANUFACTURE

Robert Parker, Danville, Calif., assignor to RPR, Inc., Dublin, Calif.

Division of Ser. No. 351,220, April 16, 1973, Pat. No. 3,861,213, which is a continuation-in-part of Ser. No. 263,064, June 15, 1972, abandoned. This application Oct. 24, 1974, Ser. No. 517,718
The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.
Int. Cl.² G01K 11/16
U.S. Cl. 73—356 **13 Claims**

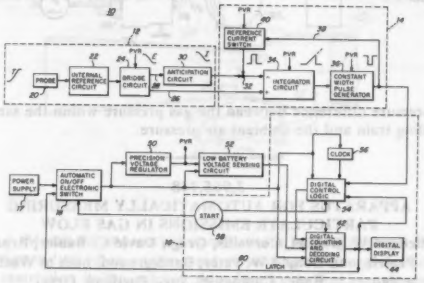


1. A digital thermometer readable by comparing the intensity of the visibility of adjacent digits comprising: a support having a plurality of transparent areas in the form of digital representations, delineated by opaque borders in a predetermined order of increasing value; a plurality of different microencapsulated temperature responsive liquid crystal compositions having different temperature response ranges, wherein each of said transparent areas has a substantially uniform coating of a thickness about the same as its adjacent transparent areas of a liquid crystal composition having a lower transition temperature below the numerical value represented by its digital representation and having an upper transition temperature above the numerical value represented by its digital representation and overlapping the temperature response range of the liquid crystal composition coated onto the transparent area of the digital representation of the next succeeding numerical value, the amount of overlap between adjacent digital representations being sufficiently consistent and of a magnitude so that the relative intensity of adjacent digits can be compared to estimate temperature.

3,965,743
AUTOMATIC ON-OFF ELECTRONIC SWITCH

Robert Bruce Turner, Weymouth, Mass., assignor to American Medical Electronics Corporation, Newton Upper Falls, Mass.

Filed May 28, 1974, Ser. No. 473,493
Int. Cl.² G01K 7/24
U.S. Cl. 73—362 AR 3 Claims



1. An electronic thermometer system comprising:

a temperature sensing circuit for sensing temperature variations and providing a first signal representative thereof;

a temperature measuring circuit responsive to said first signal provided by said temperature sensing circuit for producing a second signal representative of the temperature being sensed;

a time measuring circuit;

a display circuit responsive to said time measuring circuit and said temperature measuring circuit, for indicating the measured temperature during one period and the measured time during another period;

a power supply;

an actuator; and

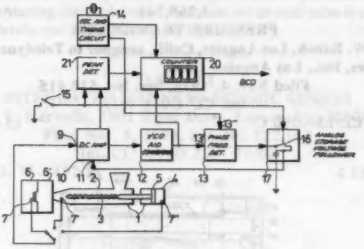
an automatic electronic switch responsive to an initial operation of said actuator to provide power from said power supply to said circuits and to continue to provide power from said power supply to said circuits independent of further operation of said actuator during an interval at least as long as the combined periods and automatically and independently of further operation of said actuator, at the end of said interval, to cease providing power to said circuits and end the display.

3,965,744
EQUIPMENT FOR COMPENSATING FOR SENSOR VARIATIONS

Lothar Gutjahr, Denzlingen, Germany, assignor to Klockner-Werke AG, Duisburg, Germany

Filed Apr. 16, 1975, Ser. No. 568,579
Claims priority, application Germany, Apr. 25, 1974, 2419914
Int. Cl.² G01L 19/04
U.S. Cl. 73—393 8 Claims

1. In measurement equipment having sensor means for furnishing a sensor output signal indicative of the value of a measured characteristic and wherein said sensor output signal undergoes undesired variations as a function of at least one factor other than said measured characteristic, equipment for compensating for said undesired variations, comprising, in combination, DC amplifier means having a first input connected to said sensor means for receiving said sensor output signal, a second input, and an amplifier output, for furnishing an amplifier output signal varying as a function of signals at said first and second inputs at said amplifier output; analog-digital converter means connected to said DC amplifier means for furnishing a digital signal having a frequency corresponding to said amplifier output signal; stabilized oscillator means for furnishing a frequency stabilized signal; phase detector means connected to said analog digital converter means and said stabilized oscillator means for furnishing a DC compensating voltage varying as a function of the phase difference between said digital signal and said frequency stabilized signal; storage means connected to said second input of said DC amplifier means; and means for connecting said storage means

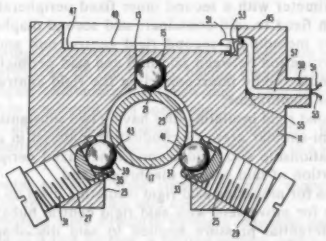


to said phase detector means prior to each measurement thereby creating a closed loop circuit, and for disconnecting said storage means from said phase detector means during each measurement, whereby the value of said DC compensating voltage immediately preceding each measurement is maintained during said measurement.

3,965,745
EXTERNALLY MOUNTED TRANSDUCER FOR DETECTING CHANGES OF FLUID PRESSURE IN A PIPE

Thomas H. Carey, Chester, Pa., assignor to Columbia Research Laboratories, Inc., Woodlyn, Pa.

Filed Feb. 5, 1975, Ser. No. 547,342
Int. Cl.² G01L 9/06
U.S. Cl. 73—398 AR 9 Claims



1. An externally mounted device for detecting changes of fluid pressure in a pipe comprising in combination: housing means having a cut-away section therein formed to fit over said pipe; notch means formed in said housing means and formed to open into said cut-away section; first contact means disposed in said notch means and formed to have a substantially spherical surface extending into said cut-away section so that said first contact means only contacts said pipe at a first tangential point; first and second cavity means formed in said housing means and formed to open into said cut-away section; second contact means disposed in said first cavity means and formed to have a substantially spherical surface extending into said cut-away section so that said second contact means only contacts said pipe at a second tangential point; third contact means disposed in said second cavity means and formed to have a substantially spherical surface extending into said cutaway section so that said third contact means only contacts said pipe at a third tangential point and said third contact means disposed so that said first, second and third tangential points lie in a plane and define a hold in said plane into which

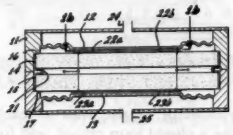
said pipe can be disposed; and piezo-electric crystal means mounted in said housing means whereby when a change of fluid pressure occurs in fluid passing through said pipe, said first, second and third contact means will respond to flex said housing means, which in turn will bend said piezo-electric crystal, to thereby produce voltage signals in accordance with said change of pressure in said pipe.

3,965,746

PRESSURE TRANSDUCER

Jan W. Rabek, Los Angeles, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Nov. 4, 1974, Ser. No. 520,415
Int. Cl.² G01L 9/12
U.S. Cl. 73—398 C **13 Claims**



1. A fluid pressure transducer comprising:
a fluid-tight container;
a first diaphragm forming a wall portion of said container, said first diaphragm having a rigid perimeter with an inner peripheral flat portion fixed to said container, said first diaphragm further including a rigid central hub and annular corrugations between said hub and said perimeter;
a rigid insulating disc having two substantially equal semi-annular areas of conductive material adjacent to and cooperating capacitively with said inner peripheral flat portion of said disc-shaped wall;
a second diaphragm forming a wall portion of said fluid-tight container, said second diaphragm having a rigid perimeter with a second inner fixed peripheral flat portion fixed to said container, said second diaphragm further including a second rigid central hub and annular corrugation between said hub and said perimeter;
a spindle rigidly interconnecting the rigid central hubs of said diaphragms;
a second rigid insulating disc having two substantially equal semi-annular aresa of conductive material in capacitive relationship with said second inner fixed peripheral flat portion of said second diaphragm; and
means for mounting said rigid insulating discs on said spindle for movement with said rigid central hubs; whereby differential pressure applied to said disc-shaped walls increases the capacitances between one pair of semi-annular conductive areas and the corresponding peripheral flat portion of one of the diaphragms and decreases the capacitances between the other pair of semi-annular conducting areas and the corresponding peripheral flat portion of the other diaphragm.

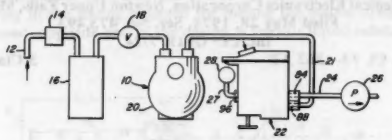
3,965,747

GAS SAMPLING SYSTEM AND METHOD

Richard E. McCorkle, Glendale, Calif., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Oct. 24, 1972, Ser. No. 300,001
Int. Cl.² G01N 1/24
U.S. Cl. 73—421.5 R **9 Claims**

1. A method of isokinetic sampling of a flowing stream of particulate bearing gases comprising the steps of; applying a vacuum to a sampling train communicating with such a stream; measuring the volume rate of gas flow from such a stream through said train; continuously controlling the vacuum pressure of the gas flowing through said train to provide a constant internal vacuum pressure within said train; and said controlling of vacuum pressure is in response to sensing the



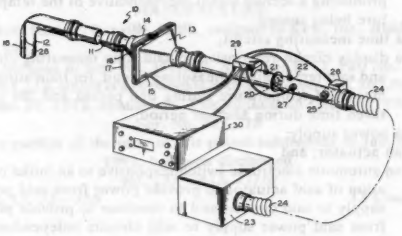
pressure difference between the gas pressure within the sampling train and the ambient air pressure.

3,965,748

APPARATUS FOR AUTOMATICALLY MEASURING PARTICULATE EMISSIONS IN GAS FLOW

Richard W. Boubel, Corvallis, Oreg.; David C. Babler, Brush Prairie, and Donald W. Peter, Battleground, both of Wash., assignors to Rader Companies, Inc., Portland, Oreg.

Filed Nov. 18, 1974, Ser. No. 524,749
Int. Cl.² G01N 1/24
U.S. Cl. 73—421.5 A **15 Claims**



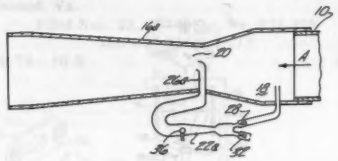
1. An isokinetic sampling apparatus for measuring particulate emissions in a gas flow, comprising:
tubular means for insertion in said gas flow for receiving a portion of said gas flow,
filter means for collecting particulate matter,
means for measuring velocity pressure in said gas flow as exerted by the flowing gas due to its kinetic energy, and temperature sensing means for sensing the temperature in said gas flow,
means for measuring pressure drop in said tubular means, and temperature sensing means for sensing the temperature in said tubular means,
suction pressure applying means attached to said tubular means for moving gas through said tubular means,
means responsive to said means for measuring velocity pressure in said gas flow and to both said temperature sensing means for continuously calculating the pressure drop within said tubular means that would establish the volume rate of gas passing through said sampler as kinetically equivalent to the velocity of gas in said gas flow, and for calculating and providing a direct output reading indicative of gas flow in response to a measured pressure and temperature,
and means responsive to said calculating means and to said means for measuring pressure drop in said tubular means for changing the flow in said tubular means as brought about by said suction pressure applying means until the measured pressure drop in said tubular means substantially equals the calculated value.

3,965,749

SAMPLING AND DILUTION METHOD

Stephen C. Hadden, Cambridge, and Leonard R. Hulls, Marblehead, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 19, 1975, Ser. No. 559,856
Int. Cl.² G01N 1/22
U.S. Cl. 73—421.5 R 1 Claim



1. Means for measuring combustibles passing through the exhaust duct of an engine: said measuring means comprising a restriction in the exhaust duct forming a first superatmospheric pressure zone upstream therefrom and a second subatmospheric pressure zone downstream therefrom; a sampling chamber having a first conduit communicating with the superatmospheric pressure zone and a second conduit communicating with the subatmospheric pressure zone; said sampling chamber and its conduits being constructed to offer a flow resistance such that some of the engine exhaust gas is caused to be temporarily diverted through the sampling chamber via the first and second conduits; a third air coolant conduit communicating the ambient atmosphere with the sampling chamber, whereby cooling air is drawn into said chamber for intermixture with the diverted gas; and a combustibles sensor located within the chamber for detecting combustibles in the flowing gas-air mixture; a first pressure-responsive constant flow valve located in the first conduit, and a second pressure-responsive constant flow valve located in the third conduit; said valves cooperatively assuring a substantially constant ratio between the flow rates in the first and third conduits irrespective of variations in pressure differential between the first and second zones.

3,965,750

LIQUID SAMPLER AND STERILIZER

Julius Theodore Johnson, 348 - 20th St., SE., Cedar Rapids, Iowa 52403

Filed Feb. 21, 1975, Ser. No. 551,699
Int. Cl.² G01N 1/10
U.S. Cl. 73—425.4 R 7 Claims

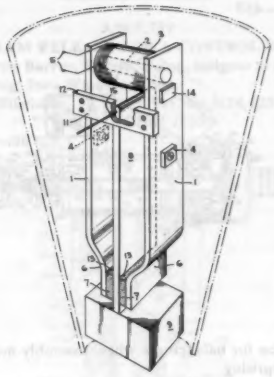
1. A sampling device useful for sampling liquids with strata of different compositions comprising an elongated tube having on one end thereof annular groove means, a well cap having bottom and side walls defining a liquid-holding well with an open side facing said tube, said end of said tube extending into said liquid-holding well, said cap further having peripherally spaced, axial fingers extending from its open side, the ends of said fingers being seated loosely in said groove means in a manner allowing rotation and limited tilting of said cap on said end of said tube, the liquid being sampled flowing between said fingers and into said end of said tube via said well cap as the tube is lowered substantially vertically through the body of liquid being sampled, and, with said tube held vertically, said end of said tube extending into said well providing, after said tube is filled with liquid to be sampled, a seal preventing air from entering the said end of said tube when said tube is raised completely out of said body of liquid.

3,965,751

INTEGRATED MAGNETO-SEISMIC SENSOR

Zaboj V. Harvalik, 5901 River Drive, Lorton, Va. 22079

Filed Nov. 8, 1974, Ser. No. 522,167
Int. Cl.² G01D 7/02, 21/04
U.S. Cl. 73—432 R 4 Claims



1. An integrated sensor assembly for the detection of intrusion disturbances, of the variety having magnetic signal or seismic signal characteristics, when said sensor assembly is emplaced in a selected area comprising:

an all encompassing casing of nonmagnetic material adapted for emplacement in seismic relation in a selected area,

a magnetic armature yoke structure rigidly supported in seismic relation within said casing,

said armature yoke structure having a magnetic path consisting of a first section, a second section, and a defined air gaps section between a first selected end of each of said first and second sections, and a third section connected to the opposite end of each of said first and second sections and disposed therebetween, said first, second, and third sections of said magnetic armature yoke being of a material having a high initial permeability,

said third section having an inductance means wound thereabout such that changes in magnetic flux conditions in said air gaps section produces a first signal, having a frequency within a first selected frequency range, across said inductance means representative of said changes in magnetic flux conditions, and an elongated pendulum member,

nonmagnetic means for pivotedly attaching said elongated pendulum member to said yoke structure in the vicinity of said third section thereof, the length and configuration of said pendulum member and the pivot connection of said means for attaching adapted such that said pendulum member extends through and beyond said air gaps section and, in at least one selected orientation of said casing, is

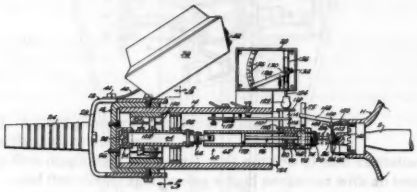
pivotedly moveable within said air gaps section in response to seismic movement of said casing, at least that portion of said pendulum member within said air gaps section being of a material which creates a magnetic flux disturbance when said pendulum member moves relative to said first selected ends of said first and second sections of said yoke structure within said air gaps section and produces a second signal, having a frequency within a second selected frequency range, across said inductance means representative of the movement of said pendulum member.

3,965,752

BALANCING DEVICE FOR VEHICLE WHEELS

Commodore Davis, Rte. No. 1, Box 289, Big Pine Key, Fla. 33043

Filed Oct. 16, 1975, Ser. No. 622,894
Int. Cl.² G01M 1/28
U.S. Cl. 73—457 16 Claims



1. A device for balancing a wheel assembly mounted on a vehicle comprising,

A. a main housing defining an interior chamber and having an open front end;

B. a rotor shaft extending axially through said chamber and providing,

1. a back portion rotatably journaled in said chamber, and

2. a tubular front portion with a universal joint connection to said back portion;

C. probe means slidably journaled in said tubular front portion and including an extended outer end portion for centered engagement with the outer end of the wheel spindle to receive up and down oscillating movement of an out-of-balance wheel;

D. means to drivingly engage the wheel to said rotor shaft to rotate said rotor shaft in unison with the wheel when the wheel is rotated and the probe means is engaged with the wheel spindle;

E. means to transmit upwardly oscillating movement of said front portion, received from said wheel spindle by said probe means, to a first switch means;

F. a first dial means comprised of a first plurality of lights to visually indicate the location of the out-of-balance condition on the wheel when the wheel is rotated;

G. a first electric circuit means, activated by said first switch means to illuminate at least one of said first plurality of lights which visually indicates the location of the maximum out-of-balance on the wheel;

H. a second dial means comprised of a second plurality of lights to visually indicate the amount of weight necessary to bring the wheel into balance;

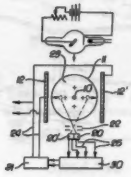
I. a second switch means activated by the oscillating movement of said first position to energize a second electric circuit means to illuminate the light of said second plurality which indicates the needed amount to weight to achieve a balanced condition of the wheel.

3,965,753

ELECTROSTATIC ACCELEROMETER AND/OR GYROSCOPE RADIOISOTOPE FIELD SUPPORT DEVICE

Alva LaRoy Browning, Jr., P.O. Box 4023, Santa Barbara, Calif. 93103

Continuation-in-part of Ser. No. 41,845, June 1, 1970, abandoned. This application Oct. 9, 1973, Ser. No. 404,294
Int. Cl.² G01C 19/24; G01P 15/08
U.S. Cl. 73—504 9 Claims



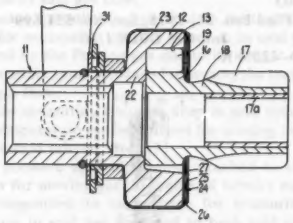
1. A sensing instrument including: a housing forming a closed chamber, an electrically charged sensing mass in said chamber, said sensing mass having a mass in excess of that subject to Brownian movement, said mass having therein radioactive material of selected particle emitting capability with a constant charge-to-mass ratio, an electrode assembly providing a supporting means comprising a plurality of pairs of electrodes with electrodes of respective pairs mounted on diametrically opposite side of said chamber and having a D.C. electric circuit interconnecting each pair of electrodes whereby said mass is freely supported by externally applied electric forces in a condition of stable equilibrium; and a detector in electrical operating association with at least one pair of electrodes and responsive to displacement of said sensing mass, said detector being mounted exteriorly with respect to said chamber.

3,965,754

ROLLER CLUTCH ASSEMBLY

Roy Price Bowcott, Solihull, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Apr. 28, 1975, Ser. No. 572,019
Claims priority, application United Kingdom, May 15, 1974, 21540/74
Int. Cl.² F02N 15/06; F16D 41/06
U.S. Cl. 74—6 6 Claims



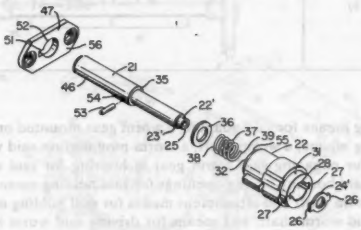
1. A roller clutch assembly including a clutch outer member arranged to be driven, a clutch inner member carrying a pinion gear wheel, a radial shoulder between said inner member and said gear wheel, a plurality of rollers disposed between said inner and outer members, a plurality of compression springs, each spring urging a respective roller in a circumferential direction and, an annular washer, said washer being formed in at least two parts and being carried by the outer clutch member, said washer abutting said radial shoulder so as to retain the inner clutch member within the outer clutch member, and the parts defining said washer being so shaped

that the abutting edges of the parts are disposed other than parallel to the adjacent convolutions of said springs.

3,965,755
CONTROL DEVICE HAVING LOCKING SELECTOR MEANS

David M. Rosenberg; Henry F. Hild, and John W. Stearley, all of Indiana, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 25, 1974, Ser. No. 526,975
Int. Cl.² F16H *35/18*
U.S. Cl. 74—10 R **6 Claims**

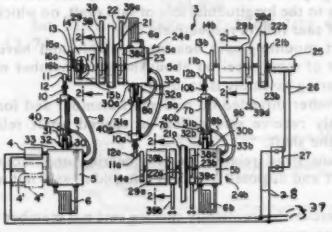


1. In a control device having a housing provided with a movable actuator and a rotatable selector shaft for positioning said actuator in relation to the rotational position of said shaft, the improvement comprising an actuator driver carried by said shaft and being operatively interconnected to said actuator to drive the same upon rotation of said driver by said shaft, said shaft and driver being axially movable relative to said actuator, said housing having a latching means, said shaft having a latching means remote from said drive and cooperable with said latching means of said housing when said shaft is in a certain rotational and axial position relative to said housing whereby said shaft cannot be rotated relative to said housing until said shaft is axially moved from said certain axial position to another axial position to clear said latching means of said shaft from said latching means of said housing, said latching means of said housing comprising part of a front cover of said housing, said part of said front cover comprising a plate carried by said front cover.

3,965,756
MULTI-SPEED AND LEVERAGE MOTOR

Alfredo E. Valles, 610 Salem Ave., Apt. A-3, Elizabeth, N.J. 07207

Filed Mar. 14, 1975, Ser. No. 558,250
Int. Cl.² F16H *25/08*
U.S. Cl. 74—22 R **10 Claims**

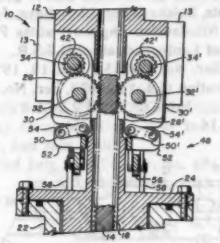


1. A multi-speed and leverage motor device comprising in combination: a first motor means for imparting a rotary motion to drive a shaft; a first rotary drive shaft drivable rotatably by operative connection to said first motor means; a first fluid compressor means for providing fluid pressure, including a first fluid piston reciprocatable in alternating to and fro action directions in a cylinder extending along its longitudinal axis, the fluid compressor means including valve elements adapted to effect fluid reciprocatable motion of the first fluid piston in said directions, the first fluid compressor means being operatively connected for the driving and operation thereof by said first rotary drive shaft; a first crank structure; and a first gear ratio means for providing predetermined mechanical and speed advantages having a second drive shaft extending therefrom and drivable thereby, the crank structure being drivable of and connected to the gear ratio means for providing predetermined mechanical and speed advantages and having a second drive shaft extending therefrom and drivable thereby, the crank structure being drivable of and connected to the gear ratio means at one end of the crank structure and connected to be driven at an opposite end of the crank structure by the first fluid piston.

3,965,757
SCRAM RELEASE FOR A CONTROL ROD

Donald Martin Barrus, Enfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 12, 1973, Ser. No. 424,125
Int. Cl.² F16H *19/04*
U.S. Cl. 74—30 **10 Claims**



1. A linear drive apparatus, comprising:
a. a housing;
b. a longitudinally extended linearly movable toothed element disposed in said housing;
c. a gear adapted to engage said toothed element;
d. means mounted on said housing for driving said gear, said means including a chain and a chain sprocket;
e. means for concurrently rotating and disengaging said gear from said linearly movable element by moving said gear away from said linearly movable element.

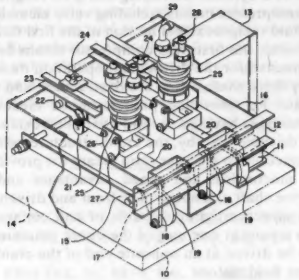
3,965,758
CONTROLLABLE PUMPS

Henry F. Hope, and Stephen F. Hope, both of 2548 Wyandotte Road, Willow Grove, Pa. 19090

Filed Nov. 1, 1974, Ser. No. 520,009
Int. Cl.² F16H *21/32*; F01B *31/14*
U.S. Cl. 74—41 **19 Claims**

1. In a system for simultaneously reciprocating with controllable stroke lengths a plurality of reciprocable devices:
a plurality of levers for respectively activating the different ones of said reciprocable devices;
means connecting together one end of each said lever for simultaneous reciprocating movement thereof; and
means providing a separate pivot for a portion of each said lever distant from said connected-together end, each pivot means being separately adjustable in position

lengthwise of its lever, and each lever having attached to it, between its said connected-together end and adjustable pivot, means for activating the stroke of a respective one of said reciprocating devices.

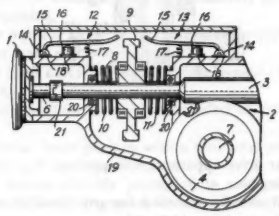


3,965,759

SAFETY DEVICE FOR THE DRIVE OF A CLOSING MEMBER

Andrei Dmitrievich Plotnikov, ulitsa Zhukovskogo, 38, kv. 18, Leningrad; Viktor Andreevich Soloviev, ulitsa Volkhovskaya, 9, Mga, Leningradskoi oblasti; Tigran Ovanesovich Ter-Mateosiants, Bolshaya Porokhovskaya, 44, korpus 3, kv. 97, and Oleg Nikolaevich Shpakov, ulitsa Prazhskaya, 33, kv. 103, both of Leningrad, all of U.S.S.R.

Continuation of Ser. No. 298,632, Oct. 18, 1972, abandoned.
This application Oct. 15, 1974, Ser. No. 515,039
Int. Cl.² F16H 27/02
U.S. Cl. 74—89.14 **2 Claims**



1. A safety device for the drive of a closing member, comprising a switch for the drive and a mechanical overload sensor made in the form of a nut located on a shaft of the drive, said nut being spring-loaded at both end faces thereof; displacement of said sensor along the shaft causing said sensor to interact with the switch arranged to cut said drive out should an overload thereof arise, characterized in that said nut comprising a flywheel having an inertial mass sufficient for providing axial displacement thereof under variations in speed of said shaft, said nut being coupled to said shaft by means of a non-braking thread.

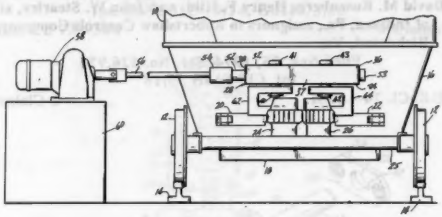
3,965,760

OPERATING APPARATUS FOR SLIDING CLOSURES FOR RAILWAY CAR

Cortez Etheredge, Jr., Augusta, Ga., assignor to Olin Corporation, New Haven, Conn.

Filed Nov. 27, 1974, Ser. No. 527,817
Int. Cl.² F16H 27/02
U.S. Cl. 74—89.14 **4 Claims**

1. In an apparatus for operating the sliding gate of a hopper car having a discharge opening at its lower end, a sliding gate covering said opening, a pair of flexible arms attached to and extending from said sliding gate, a gate gear attached to each of said arms, said gate gears intermeshing with one another, an opening in at least one of said gears, the improvement which comprises a turning means for said gate gears having at least one adapter for insertion in said opening in said gate gears,



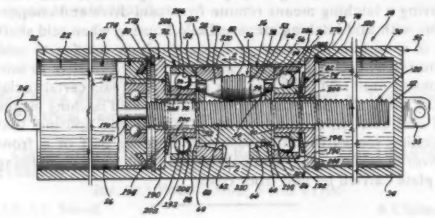
holding means for said adapter, a worm gear mounted on said holding means, a worm shaft, a worm mounted on said worm shaft for engaging said worm gear, a housing for said worm gear, said housing having openings for said holding means and said worm shaft and attachment means for said holding means and said worm shaft, and means for driving said worm shaft.

3,965,761

LINEAR ACTUATOR

Richard B. Stanley, 4 Coventry on Duxbury, Rolling Meadows, Ill. 60008

Filed Mar. 21, 1974, Ser. No. 453,326
Int. Cl.² F16H 27/02
U.S. Cl. 74—89.15 **23 Claims**



1. A linear actuator comprising:

a threaded shaft member,

a roller bearing assembly received about said shaft member and comprising a plurality of rollers having right flanges along their shanks rolling in threaded engagement with the shaft member threading, and an outer race structure defining spaced apart raceway surfaces, that are oblique relative to the longitudinal axis of said shaft, on which the ends of said rollers respectively ride,

a support mounting said bearing assembly and having a portion of same received about the shaft member which the bearing assembly is secured,

a nut member threaded on said shaft member and formed to freely receive said rollers in spaced apart relation about the shaft,

stop means fixed relative to said bearing unit mounting support and disposed adjacent one end of said nut member,

resilient means for resiliently spacing said nut member from said stop means,

whereby shock loads acting longitudinally of the shaft member in the direction of said stop means effect a yielding of said resilient means to bring said nut member end into bearing relation to said stop means to transmit said shock forces thereto.

one of said members being movable longitudinally of the shaft,

and means for rotating the other member to linearly move said one member through said bearing assembly.

3,965,762

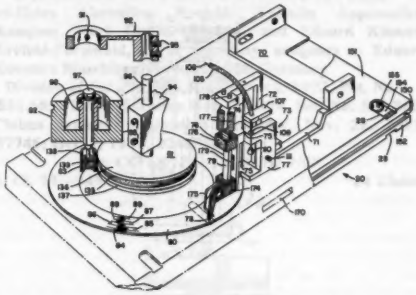
SINGLE SPEED FRICTIONAL DRIVE UNIT WITH MAGNETIC BIASING MEANS

Jiri M. Nessel, Palo Alto, Calif., assignor to Victor Richards, San Francisco, Calif.

Division of Ser. No. 421,986, Dec. 5, 1973, Pat. No. 3,930,654. This application Nov. 21, 1974, Ser. No. 525,775

Int. Cl.² F16H *13/02, 13/12*

U.S. Cl. 74—206 **4 Claims**



1. Apparatus for imparting rotary movement to a body about a given axis from a rotating shaft having its axis substantially parallel to said given axis, said apparatus comprising:

a. a drive unit in operative engagement with said body including a magnet sandwiched between a pair of circular discs of magnetic material mounted with their centers on said given axis; and

b. a hollow right circular cylinder of magnetic material mounted on said shaft coaxially therewith by means of a resilient annular member extending between said shaft and the inner surface of said hollow right circular cylinder, the exterior surface of said hollow right circular cylinder being in contact with the periphery of at least one of said circular discs.

3,965,763

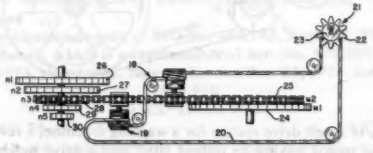
BICYCLE GEAR SHIFT

Joseph W. Wechsler, 925 Enchanted Way, Pacific Palisades,, Calif. 90272

Continuation-in-part of Ser. No. 479,990, June 17, 1974, Pat. No. 3,901,095. This application May 27, 1975, Ser. No. 580,928

Int. Cl.² B62M *9/00, 1/02*; F16H *7/22, 9/00*

U.S. Cl. 74—217 B **5 Claims**



1. In combination with a bicycle having a frame structure mounting handlebars, pedals, and front and rear wheels, an improved gear shift including:

a. a front gear cluster including two gears having N1 and N2 teeth respectively, different in number from each other, coaxially mounted in side-by-side relationship and coupled for rotation by the bicycle pedals;

b. a rear gear cluster including at least two gears having n1 and n2 teeth respectively, different in number from each other, coaxially mounted together in side-by-side relationship and coupled to rotate said rear wheel;

c. a bicycle chain passing over one of the gears in the front gear cluster and one of the gears in the rear gear cluster;

d. a front derailleur means coupled to the bicycle frame structure and to said bicycle chain associated with said front gear cluster;

e. a rear derailleur means coupled to the bicycle frame structure and to said bicycle chain associated with said rear gear cluster;

f. a dial means including a drum mounted on the bicycle for manual rotation by a bicycle rider; and

g. a single continuous actuating cable passing from said drum through the front and rear derailleur means in series and back to said drum such that partial rotation of said drum through a given circumferential distance moves said cable a given distance, said front derailleur means functioning in response to each movement of said cable through said given distance to shift said chain from one of the two gears in said front gear cluster to the other, and said rear derailleur means functioning in response to movement of said cable through twice said given distance to shift said chain from one of the gears in said rear gear cluster to the next adjacent gear, said rear derailleur means thus only effecting a shift once for every two partial rotations of said drum in the same direction through said given circumferential distance.

3,965,764

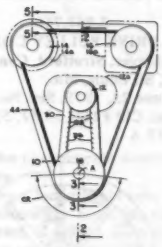
PIGGYBACK BELT DRIVE ASSEMBLY

Stellios Anthony Avramidis, Greenfield, Ind., assignor to FMC Corporation, San Jose, Calif.

Filed July 5, 1974, Ser. No. 486,262

Int. Cl.² F16H *7/00, 7/02*

U.S. Cl. 74—221 **5 Claims**

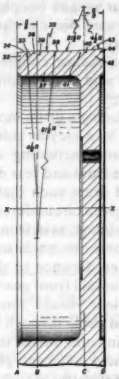


1. A drive system for a plurality of pulleys comprising a pair of endless drive belts received one over the other on at least one of said pulleys, the inner one of said belts on said one pulley received over another of said pulleys, said inner belt having an outer surface with a plurality of alternate longitudinally extending ridges and grooves therein, an outer belt of said pair being received over yet another of said pulleys, said outer belt having an inner surface with a plurality of alternate longitudinally extending grooves and ridges therein, the ridges and grooves on said inner and outer belts received in mating engagement at said one pulley.

3,965,765
PULLEY

Bernard D. Vaillette, Leominster, and William E. Zastawny, South Grafton, Mass., assignors to Cincinnati Milacron-Heald Corporation, Worcester, Mass.

Filed Mar. 17, 1975, Ser. No. 558,630
Int. Cl.² F16H 55/36, 7/18
U.S. Cl. 74—230.5 9 Claims



1. A pulley for driving a spindle in conjunction with a flat belt, comprising

a. a first portion having a surface of revolution that tapers from a large end to a small end,

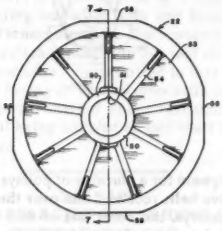
b. a second portion having a surface of revolution having a large end and a small end, the large end being located adjacent the large end of the first portion, and

c. a third portion having a surface of revolution having a large end and a small end, the small end being located adjacent the small end of the second portion, the surfaces of all three portions being composed of circular segments, the surface of the first portion being convex, the surface of the third portion being concave, and the surface of the second portion being convex adjacent the first portion and concave adjacent the third portion.

3,965,766
VARIABLE DRIVE PULLEY CONSTRUCTION

Frederick O. Luenberger, Stratford, Conn., assignor to Emerson Electric Co., St. Louis, Mo.

Filed June 23, 1975, Ser. No. 589,041
Int. Cl.² F16H 55/52, 55/36
U.S. Cl. 74—230.17 A 4 Claims

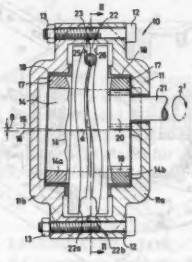


1. In a variable speed drive having a drive pulley and a driven pulley, both of said pulleys having at least one disc movable axially with respect to another disc making up said pulley, said discs having a rim, at least one of said pulleys being housed in an enclosure with an enclosure wall adjacent the perimeter-defining outer edge of the rim of said pulley, the improvement comprising a plurality of substantially chordal flats in the perimeter-defining outer edge of the rim of at least one pulley, said flats being arranged symmetrically about the axis of rotation of said pulley.

3,965,767
DRIVING PULLEY MECHANISM

Johannes Augustus Rinio, 7800 Versailles, 5, Promenade Venezia, Grand-siede, France

Filed Nov. 29, 1973, Ser. No. 420,009
Claims priority, application Germany, Dec. 1, 1972, 2258833
Int. Cl.² A01K 73/06; F16H 55/56
U.S. Cl. 74—230.24 7 Claims

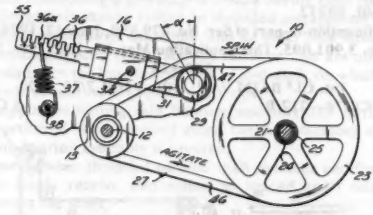


1. A driving pulley mechanism for multiple purpose hauling devices including a driving pulley and a traction cable, said driving pulley consisting of two specularly identical halves inclined toward each other and comprising each one half of a cable groove, the improvement consisting in that said halves are pressed toward each other on opposite sides at the cable supporting apex of their peripheral edges by at least one elastically yieldable clamping device consisting of a pair of pressure rollers mounted rotatably in a fixed frame and wherein said pulley halves are pressed away from each other by a spreading device at least at one point opposite said apex.

3,965,768
SLIPPING BELT CLUTCH

James R. Foster, Webster City, Iowa, assignor to Franklin Manufacturing Company, St. Cloud, Minn.

Filed July 25, 1975, Ser. No. 599,178
Int. Cl.² F16H 7/12, 7/10
U.S. Cl. 74—242.11 R 13 Claims



1. In a belt drive system for a washing machine, a reversible drive motor having an output shaft and a drive pulley fixed thereon, a transmission having an input shaft and a driven pulley fixed thereon, said transmission being adapted to effect agitation of articles in a spin tub of the machine when said transmission pulley is driven in a first rotary direction and to effect spinning of the spin tub when said transmission pulley is driven in the opposite rotary direction, a drive belt connect-

ing said pulleys, and means resiliently tensioning one reach of said belt driving said transsmission pulley in the spin direction to limit the level of torque transmitted to said transmission pulley during spin operation by permitting belt slippage when the torque limit is reached, said resilient tensioning means including means for limiting spin torque to a level sufficiently low to result in a reduction of final spin speed when an out-of-balance condition exists in the spin tub, said resilient tensioning means being substantially ineffective to limit tension in an opposite belt reach driving said transmission pulley in the agitation direction whereby full motor power is transmitted to said transmission for agitation operation.

3,965,769

ROLLER CHAINS FOR A CONTINUOUS PRESS

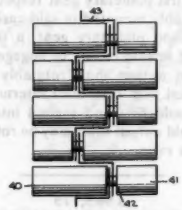
Karl-Heinz Ahrweiler, Krefeld; Valentin Appenzeller, Kempen; Kurt Quoos, Krefeld, and Eduard Küsters, Krefeld-Forstwald, all of Germany, assignors to Eduard Kuesters Maschinenfabrik, Krefeld, Germany

Division of Ser. No. 308,556, Nov. 12, 1972, Pat. No. 3,851,685. This application Nov. 4, 1974, Ser. No. 520,863

Claims priority, application Germany, Nov. 22, 1971, 2157746; Oct. 5, 1972, 2248760

Int. Cl.² G01F *3/14*; B27D *3/04*

U.S. Cl. 74—245 R **14 Claims**



1. A roller chain of the type comprising a plurality of sets of rollers disposed one set behind the other longitudinally in their direction of advance, each set comprising at least two rollers disposed side by side on a pin with links joining successive sets of rollers and establishing the longitudinal spacing therebetween, in which the improvement comprises:

a. the rollers on each individual pin spaced apart to form at least one gap; and

b. the links disposed in and maintaining said gaps such that the gaps on successive sets of rollers when viewed longitudinally in the direction of advance of the chain do not form a straight path.

3,965,770

ARM MECHANISM FOR MOVING HEAVY MATERIALS IN A TWO-DIMENSIONAL PLANE

Kenro Motoda, 9-32-4, Kami-Kitazawa, Setagaya, Tokyo, Japan

Continuation-in-part of Ser. No. 460,145, April 11, 1974, abandoned, which is a continuation of Ser. No. 331,387, Feb. 12, 1973, abandoned. This application Dec. 27, 1974, Ser. No. 536,918

Int. Cl.² G05G *9/00*

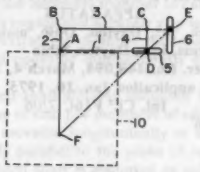
U.S. Cl. 74—471 XY **6 Claims**

1. An arm mechanism for moving heavy materials in a two dimensional plane which comprises:

a. a parallelogram link mechanism lying in a two-dimensional plane including an X-axis and a Y-axis, said parallelogram link mechanism having right and left side links arranged in the direction of the Y-axis and upper and lower side links arranged in the direction of the X-axis and rotatably coupled to said right and left side links;

b. a load holding section provided at a free end of a first arm extended from said upper side link; and

c. first and second sliding members, respectively provided at a coupling point of said right and lower side links and



at an intersection point of said left side link and a phantom line connecting said load holding section to the coupling point of said right and lower side links, for sliding in the directions of the X-axis and Y-axis.

3,965,771

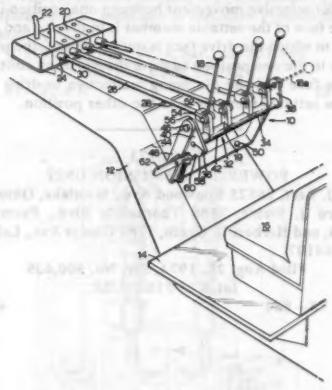
ADJUSTABLE HYDRAULIC CONTROL SYSTEM FOR A MOTOR GRADER

John Graham MacDonald, Goderich, Canada, assignor to Dominion Road Machinery Co. Limited, Goderich, Canada

Filed Oct. 15, 1974, Ser. No. 514,566

Int. Cl.² G05G *11/00*

U.S. Cl. 74—479 **9 Claims**



1. An apparatus for changing the neutral position of a control lever comprising:

1. a bearing having a longitudinal axis;

2. means for eccentrically mounting said bearing about a central axis which is spaced apart from and parallel to said longitudinal axis, said means for mounting said bearing permitting said bearing to revolve about said central axis;

3. means for selectively retaining said bearing in a plurality of desired radial positions relative to said central axis;

an end of the control lever being secured to said bearing to permit the control lever to pivot about said longitudinal axis, a connecting rod having its first end pivotally connected to the control lever and its second end connected to a device which is to be activated by the control lever; the first end of a connecting rod being positioned on the control lever so that said first end pivots about an axis which is coincident with said central axis; the control lever moving the connecting rod to activate the device when the control lever is pivoted about said longitudinal axis while said bearing remains stationary; and the control lever pivoting about said central axis when

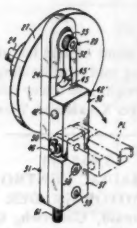
said bearing revolves about said central axis to change the radial position of the control lever relative to said central axis.

3,965,772

SELECTIVE DRIVE CONNECTION FOR A CUTTING APPARATUS

Paul H. Hamisch, Sr., Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 448,094, March 4, 1974, Pat. No. 3,867,861. This application Jan. 10, 1975, Ser. No. 540,042
Int. Cl.² F16C 7/06
U.S. Cl. 74—586 4 Claims



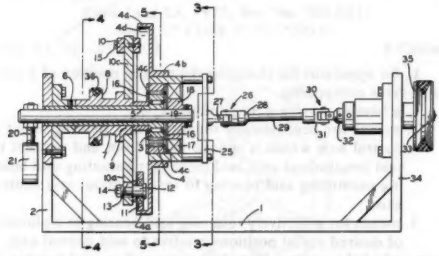
1. Apparatus, comprising: a rod having an elongated slot, a pin driven in a path and received in the slot, a settable member having a drive face, means mounting the settable member to the rod for selective movement between one position in which the drive face of the settable member is in the slot and another position in which the drive face is out of the slot, the pin being effective in the one position to drive the rod upon contact with the drive face and the pin being ineffective to drive the rod when the settable member is in the other position.

3,965,773

POWER TRANSMISSION UNIT

George J. Bert, 26825 Elmwood Ave., Westlake, Ohio 44145; Edward J. Stehle, 7188 Thorncliffe Blvd., Parma, Ohio 44134, and Herbert D. Groth, 1187 Gladys Ave., Lakewood, Ohio 44107

Filed Aug. 26, 1974, Ser. No. 500,639
Int. Cl.² F16H 1/28
U.S. Cl. 74—804 4 Claims



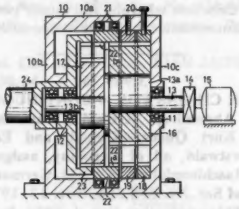
1. A power transmission unit having in combination a base, a fixed external gear mounted on said base, arm carrier means rotatably mounted on said base, at least one roller mounted on said arm carrier means, an internal gear encircling said fixed external gear engaging said fixed gear having an internal circumferential flange surface facing the rotational center of the arm carrier, said roller rollably engaging said internal flange surface effective to provide a slip-free relation therebetween, and means for supporting said internal gear for eccentric movement about said fixed gear.

3,965,774

REDUCTION GEAR APPARATUS

Toshimitsu Omi, and Takashi Omi, both of Anjo, Japan, assignors to Omi Industrial Company, Limited, Japan

Filed Jan. 17, 1975, Ser. No. 541,932
Claims priority, application Japan, Jan. 18, 1974, 49-8722
Int. Cl.² F16H 1/28
U.S. Cl. 74—805 3 Claims



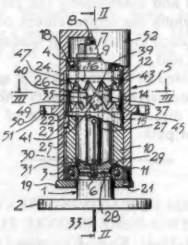
1. A reduction gear apparatus comprising a casing, an input shaft rotatably mounted in said casing having a pair of eccentric shaft portions, a first and second planetary gear rotatably mounted on said eccentric shaft portions of said input shaft, a first and second internal gear positioned in said casing to engage with said first planetary gear respectively, a coupling internal gear rotatably mounted in said casing to engage with said first and second planetary gear, a third internal gear rotatably mounted in said casing to engage with said second planetary gear, an output shaft rotatably mounted in said casing to connected with said third internal gear, means for selectively fixing said first and second internal gear to said casing, whereby said output shaft may be rotated at two different reduction gear ratio.

3,965,775

INDEXING DEVICE

Mordehay Pinkesfeld, 86 Atzmauth St., Ashkelon, Israel

Filed Dec. 27, 1974, Ser. No. 536,882
Int. Cl.² B23B 29/24; B23Q 17/02
U.S. Cl. 74—827 4 Claims



1. An indexing device comprising:
a first body member;
a second body member mounted to said first body member, said first and second body members being movable relative to one another in a first predetermined path;
a driving member mounted for reciprocal movement relative to said body member in a second predetermined path, said first predetermined path being non-parallel with said second predetermined path;
means for coupling said driving member to a source of reciprocatory motion;
driving lug means mounted to said driving member;
a plurality of driven elements coupled to said second body, said driving lug means engaging said driven elements

individually and successively in either direction of reciprocation of said driving member to cause intermittent relative motion in one direction in said first predetermined path; and

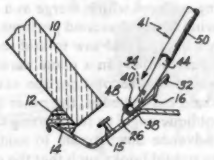
stop means cooperative between said driving lug means and said driven elements to stop said relative motion in said first predetermined path during each reciprocating stroke of said driving member, said cooperative action occurring when said driving member approaches the end of its travel in one direction thereby preventing further relative motion of said first body member with respect to said second body member in said first predetermined path until said driving member moves in the opposite direction, whereupon said cooperative action also occurs between said driving lug means and said driven elements to prevent further relative motion in said first predetermined path when said driving member approaches the end of its travel in said opposite direction.

3,965,776

TOOL FOR APPLYING RETAINER CLIPS

Charles T. Wolstenholme, R.D. 2, Box 268, Milton, Del. 19968, and Douglas E. Sipple, P.O. Box 62, Georgetown, Del. 19947

Filed Sept. 16, 1975, Ser. No. 613,878
Int. Cl.² B23P *19/08*; B25B *27/20*
U.S. Cl. 81—3 R **4 Claims**



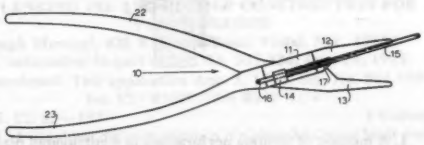
1. A tool for installing a retainer clip including a forward up-turned flange and an upwardly and rearwardly inclined central portion adapted to engage a fixed stud member, the tool comprising a pair of laterally spaced, elongated pusher prongs having vertically offset end portions, generally co-planar rearward portions and undercut inner surface areas along said end portions terminating at downwardly and forwardly sloped rear bevel surfaces, said end portions of said prongs including sections spaced laterally apart less than the total width of the forward up-turned flange of the clip to be installed by the tool, whereby the prongs may both engage said flange at the ends of the prongs during installation of the clip on either side of the central portion of the clip.

3,965,777

BROKEN NEEDLE REMOVAL TOOL FOR KNITTING MACHINES

Charles G. McMillan, Rte. 9, Box 218, Mount Airy, N.C. 27030

Filed Sept. 29, 1975, Ser. No. 617,701
Int. Cl.² B25B *7/00*
U.S. Cl. 81—5.1 R **7 Claims**



1. A tool for facilitating the removal of a slot-mounted machine element such as a knitting machine needle having a broken butt, comprising in combination:

a. a plier-type tool having on one end opposed pivotally-mounted jaw members having generally opposed flat, planar shaped surfaces for engaging and securely gripping said element and structurally interconnected with said jaws on the opposite end opposed elongated handle members and upon said handle members being forced together pivoting said jaw members together to cause said surfaces of said jaws to engage and securely grip said element; and

b. an element extracting member mounted on said plier-type tool and operable independently of said jaws and comprising:

i. an elongated shaft slidably mounted below and on a selected one of said jaw members of said plier-type tool and being movable longitudinally in a selected plane substantially parallel to the plane of said jaw member on which such shaft is mounted as said jaw members pivot back and forth and having an outward end portion extending forwardly beyond said jaw members, said shaft being arranged so that it may be centered between said jaw members when said jaw members are in a closed position;

ii. a hook tip portion integral with said outward end portion of said elongated shaft and having a width less than the width of the slot in which the element is mounted; and

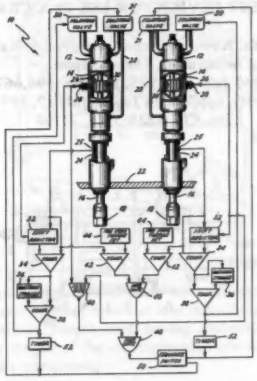
iii. resilient return means for said extracting shaft arranged to normally hold said tip portion in a forward advanced position.

3,965,778

MULTI-STAGE TIGHTENING SYSTEM

Arthur J. Aspers, Mount Ephriam, N.J., and Robert J. Finkelston, Hatboro, Pa., assignors to Standard Pressed Steel Co., Jenkintown, Pa.

Filed Sept. 19, 1974, Ser. No. 507,544
Int. Cl.² B25B *23/142*
U.S. Cl. 81—52.4 R **25 Claims**



1. A multi-stage tightening system including a plurality of wrenches each adapted to tighten a fastener, means for discontinuing the output of each of said wrenches at an initial predetermined condition, control means operatively associated with each of said wrenches for shutting off said wrenches at a final predetermined condition, and interface means operatively associated with said control means for determining when all of said wrenches have discontinued their output, including checking means for determining if all of said wrenches have provided an output, and for thereafter reactivating said wrenches if each of said wrenches maintains some

minimum output, whereby said control means can shut off said wrenches at said final predetermined condition.

3,965,779

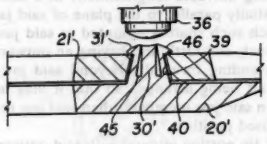
CAST ARTICULATED TOOL

Karl Hannes, White Plains, and Paul C. Rossi, Franklin Square, both of N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.

Division of Ser. No. 434,106, Jan. 17, 1974, Pat. No. 3,880,021. This application Dec. 26, 1974, Ser. No. 536,357

Int. Cl.² B25B 7/08

U.S. Cl. 81—416 9 Claims



1. A cast articulated tool comprising first and second cast members, said first member having a continuously linearly tapered aperture extending therethrough, said second member having a pin with an enlarged head extending from one side thereof formed integrally with said second member, said pin being tapered with the larger diameter end thereof toward said second member, the tapered portion of said pin having a form corresponding to the form of said aperture and being fitted within said aperture to form an articulated joint between said members, said tapered portion of said pin being continuously tapered in the same direction in the portion thereof fitted in said aperture, whereby said enlarged head inhibits separation of said members.

3,965,780

WORK REST DEVICE FOR USE IN A CRANK PIN MILLER

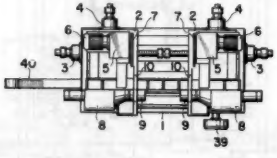
Shingo Yamada, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed July 17, 1975, Ser. No. 596,667

Claims priority, application Japan, July 17, 1974, 49-81174

Int. Cl.² B23B 5/18, 25/00

U.S. Cl. 82—9 5 Claims



1. A work rest device for use in a crank pin miller which comprises;

a pair of saddles mounted on a bed of the miller and moved in longitudinal and transverse directions of the bed;

a pair of main bodies of said device mounted on said saddles, respectively, each of said bodies having a work clamping means for clamping a main journal part of a work adjoining a pin journal part of the work to be cut;

a spline shaft connected through gears to an electric motor for rotating said work; and

a gear train provided between said work clamping means and said spline shaft for rotating said work clamping means at the synchronous rotating speed with that of said work.

3,965,781

BANDSAW BOOK TRIMMER

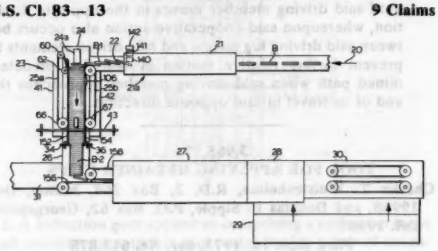
William Felix Stroud, deceased, late of McKellar, Canada (by Lois Evelyn Stroud, executrix), and Edward John Stroud, McKellar, Canada, assignors to Stroud Graphic Equipment Limited, McKellar, Canada

Continuation-in-part of Ser. No. 318,617, Dec. 26, 1972, Pat. No. 3,888,150. This application Mar. 31, 1975, Ser. No. 563,425

Claims priority, application United Kingdom, Jan. 1, 1972, 15; Apr. 9, 1974, 15627/74

Int. Cl.² B26D 1/52

U.S. Cl. 83—13 9 Claims



1. A method of trimming selvage from a plurality of books including the following steps: providing a saw having a pair of oppositely facing surfaces which merge at a cutting edge, one said surface having first and second portions, said first portion extending from a base of said saw to said second portion and being disposed substantially in a plane parallel to the cutting run of said saw and said second portion extending from said first portion to said cutting edge, the other said surface being oriented at an oblique angle to said cutting run plane; causing said books to advance downstream to said saw; positioning said saw relative to said books such that the cutting run of said saw is both normal to the direction of advance of said books and is substantially parallel to the plane of the pages of said books and such that said one surface faces pages to be trimmed by said saw and the other said surface faces selvage to be trimmed by said saw; and trimming said books by means of said saw.

3,965,782

MANUFACTURING CORRUGATED PERFORATED PLASTIC TUBE

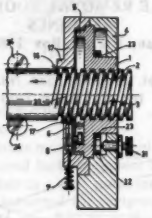
Arnoldus Willem Jan Leloux, Dedemsvaart, Netherlands, assignor to Wavin B.V., Netherlands

Filed July 10, 1974, Ser. No. 487,201

Claims priority, application Netherlands, July 16, 1973, 7309844

Int. Cl.² B26D 7/10; B26F 1/00

U.S. Cl. 83—15 6 Claims



1. A method of forming perforations in a corrugated plastic tube, comprising the steps of:

supporting said corrugated plastic tube only from the exterior thereof;

passing said corrugated plastic tube through a guide member;

supporting said corrugated plastic tube on more than one side of the region where said corrugated plastic tube is to be perforated; and

subjecting said corrugated plastic tube to the simultaneous action of at least two substantially parallel punching members which point in substantially the same direction and which lie substantially in a plane which is oriented substantially transverse to the longitudinal axis of said corrugated plastic tube to form said perforations therein.

3,965,783

AUTOMATIC SLICING MACHINE FOR FOOD STUFFS

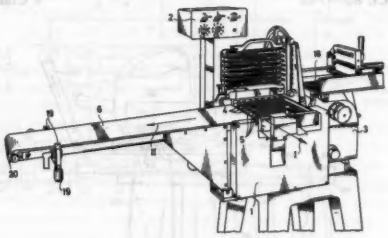
Ernst Muller, and Albrecht Maurer, both of Balingen, Germany, assignors to Bizerba-Werke Wilhelm Kraut K.G., Balingen, Wurttemberg, Germany

Filed Mar. 17, 1975, Ser. No. 559,366

Claims priority, application Germany, Mar. 21, 1974, 2413711

Int. Cl.² B26D *4/46*

U.S. Cl. 83—88 **9 Claims**



1. In combination with a food slicing machine having a rotating slicing blade for cutting food stock such as meats and cheese and an advancable and transversely reciprocable carriage for support and movement of the food stock toward as well as transversely across the cutting edge of the slicing blade to cut and supply in sequence severed slices of such stock, a slice removing means disposed in the slice release region of said blade comprising a linearly moveable planar deposit surface comprising a plurality of parallel side-by-side spaced individual transport belts providing individual longitudinal surfaces each moveable linearly in a direction away from said slicing blade, said deposit transport belts having associated interspaced rolls below said belts moveable into a position of projection above the deposit surface level of said belts for lifting of foodstuffs from said belts and movement thereof transversely to the direction of movement of said belts.

3,965,784

BLANKING DIE AND HOLDER CONSTRUCTION FOR PUNCH PRESSES

Joseph Marconi, 428 S. Jensen Road, Vestal, N.Y. 13850

Continuation-in-part of Ser. No. 317,236, Dec. 21, 1972, abandoned. This application Apr. 3, 1975, Ser. No. 564,658

Int. Cl.² B26D *7/06*; B26F *1/14*

U.S. Cl. 83—157 **3 Claims**

1. A blanking die comprising a die plate having at least one die opening to cooperate with the punch of a press, a holder for said die having a bottom wall and side walls defining a space beneath said die, a shuttle plate in said holder mounted for movement within said space to an inward position in which it underlies said die and to an outward position in which it is entirely removed from beneath said die opening, said shuttle

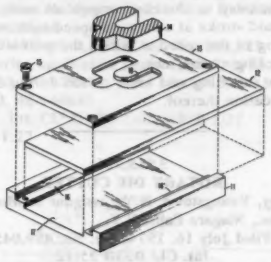


plate performing the function in its inward position of supporting said die during blanking operation.

3,965,785

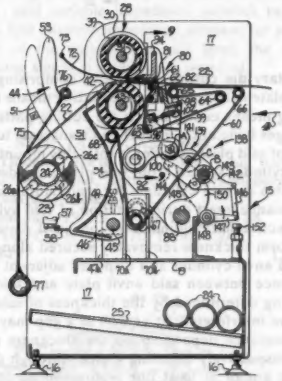
APPARATUS FOR CUTTING SHEET MATERIAL

Herman S. Johns, Gastonia, N.C., assignor to Medical Specialties, Inc., Charlotte, N.C.

Filed Feb. 26, 1975, Ser. No. 553,444

Int. Cl.² B26D *1/56*; B23D *25/06*

U.S. Cl. 83—316 **26 Claims**



1. An apparatus for accurately and efficiently cutting a continuous web of sheet material into individual cut segments of predetermined length and having provision for readily adjusting the length of the cut segments between wide limits, said apparatus comprising

a frame,

means carried by said frame for continuously feeding the web along a predetermined path of travel,

knife means extending transversely across said path of travel for cutting the web of sheet material into individual cut segments,

means for mounting said knife means on said frame such that said knife means may be periodically reciprocated forwardly and rearwardly to define a stroke which extends along a direction substantially parallel to said path of travel of the web of sheet material, said mounting means including a cam follower surface,

means for periodically reciprocating said knife means along said stroke, and comprising an endless non-slip belt carried by said frame for translation about a predetermined

trackway, means for continuously translating said belt about said trackway at a predetermined speed, and cam means carried by said belt for engaging said cam follower surface during a portion of the movement thereof along said trackway to thereby reciprocate said knife means along said stroke at a forward speed substantially corresponding to the speed at which the web is advanced by said feeding means, and

means for actuating said knife means during each forward reciprocation thereof.

3,965,786

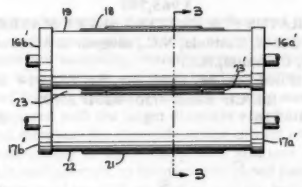
ROTARY DIE CUTTER

Emil D'Luhy, Youngstown, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed July 16, 1974, Ser. No. 489,045

Int. Cl.² B23D *25/12*

U.S. Cl. 83—346 **6 Claims**



1. A rotary die cutting apparatus, comprising a rotatably mounted plate cylinder having die cutting means thereon, said die cutting means comprising a die cutting pattern including cutting edges lying both parallel and transverse to the longitudinal axis of said plate cylinder, a rotatably mounted cooperating anvil cylinder spaced from said plate cylinder, contacting bearer plates on said cylinders for maintaining said cylinders a fixed distance apart during rotation of said cylinders about their respective longitudinal axes, an anvil plate of substantially uniform thickness removably secured along the periphery of said anvil cylinder and disposed adjacent said pattern, the clearance between said anvil plate and said die cutting means being determined by the thickness of said anvil plate, whereby an interference fit as well as a gap may be provided as said clearance depending on the thickness of said anvil plate for respectively effecting a clear-through die cut and a partial die cut of at least one web arranged for movement between said cylinders, and whereby any contact between said die cutting means and said anvil cylinder is avoided by means of said anvil plate.

3,965,787

RETRACTABLE BLADE GUARD

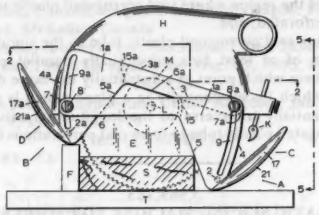
Eugene W. Plischke, 99-549 Pohue Place, Aiea, Hawaii 96701

Filed Dec. 15, 1975, Ser. No. 640,850

Int. Cl.² B27G *19/04*

U.S. Cl. 83—478 **10 Claims**

1. A retractable blade guard for use as a lower safety guard of a rotary power cutting tool comprising a guard section and securing means for pivotally mounting the guard section on the hood guard of said cutting tool; the guard section has an obverse leaf, a reverse leaf, a rod and an extension; the obverse leaf is rigidly connected to the reverse leaf in the vicinity of their lowest contact points by the rod and the extension; the guard section is arranged to pivot about an axis which is located beyond the circumference of the cutting tool; the guard section is arranged to shield a portion of the arc of travel of said cutting tool; and the guard section is arranged to automatically adjust itself to the thickness of a stock being cut and



remain in contact with the stock being cut to give maximum protection possible during the operation of said cutting tool.

3,965,788

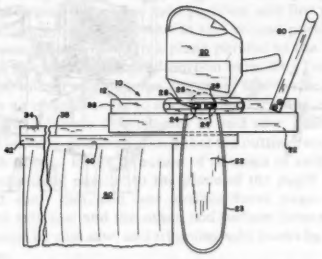
LUMBER MAKING ATTACHMENT

Elof Granberg, 201 Nevin Ave., Richmond, Calif. 94801

Continuation-in-part of Ser. No. 417,603, Nov. 20, 1973, abandoned. This application June 11, 1974, Ser. No. 478,245

Int. Cl.² B27B *17/02, 27/02*

U.S. Cl. 83—745 **4 Claims**



1. A lumber making attachment for use in cutting lumber with a chain saw comprising

an elongated longitudinal support member having an elongated guide bearing runner secured to the underside thereof, said guide bearing runner having a longitudinal inverted "V" shaped groove formed in the underside thereof for slidably engaging a mating guide member positioned on the upper surface of said lumber whereby said guide member can be comprised of a single piece of angle iron disposed longitudinally on said lumber with its V back inverted and pointing upward for mating with said elongated guide bearing runner,

at least two elongated horizontal crossmembers secured to and extending in opposite directions from said support member, and engaging a stabilization rail mounted in spaced relation and substantially parallel to said guide bearing runner and support member, said stabilization rail being adapted to slide along a planar surface disposed perpendicular to the cut to be made in the lumber by the chain saw for rigidly supporting the cutter bar of the chain saw with respect to said lumber,

an elongated clamping bar mounted to said horizontal crossmembers on the side of said support member opposite said stabilization rail, said clamping bar being adjustably movable along said crossmembers with respect to said support member for securing the cutter bar of the chain saw therebetween, a first clamping plate being secured to said support member substantially midway between said horizontal crossmembers and a second clamping plate being secured to said clamping bar sub-

stantially opposed to said first clamping plate whereby the saw bar of said chain saw can be rigidly secured by said plates parallel and at any preselected angulation with respect to said support member and guide bearing runner, and

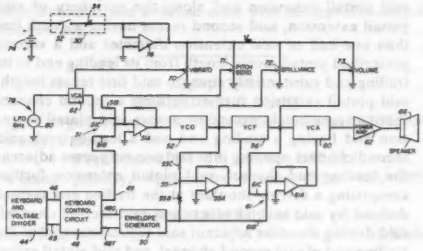
a push bar secured to said frame for moving said support member and the chain saw along the guide member.

3,965,789

ELECTRONIC MUSICAL INSTRUMENT EFFECTS CONTROL

Alan R. Pearlman, Newton Highlands, Mass., assignor to ARP Instruments, Inc., Newton, Mass.

Filed Feb. 1, 1974, Ser. No. 438,780
Int. Cl.[2] G10H *1/04, 5/02*
U.S. Cl. 84—1.24 6 Claims



1. For an electronic musical instrument having a keyboard, means coupled from the keyboard and responsive to a minimum key pressure for providing an audio signal, and means responsive to the audio signal for generating an audible tone corresponding to the played key, effect control means comprising;

transducer means operatively associated with the keyboard and having a conductance that is variable in accordance with pressure applied to a key of the keyboard, said transducer means being disposed relative to said keyboard so as to be operative only at applied pressure above a predetermined threshold pressure, which predetermined threshold pressure is greater than said minimum key pressure,

means coupled from said transducer means for establishing a control level signal that is variable in accordance with pressure applied above said threshold pressure,

a plurality of separate selection means each one for introducing a different audio effect, at least one of said selection means being selectable,

each of said selection means being responsive to said control level signal and producing an audio effect signal that is variable in accordance with said control level signal,

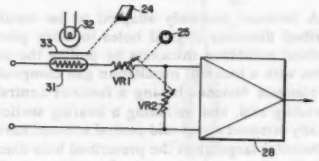
and means coupled from said selection means for altering said audio signal in accordance with at least one of said audio effect signals to thereby introduce the selected audio effect in the audible tone.

3,965,790

ELECTRONIC MUSICAL INSTRUMENT HAVING DYNAMIC RANGE VARIABLE EXPRESSION CONTROL

Shigeru Suzuki, and Takeshi Adachi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sept. 4, 1974, Ser. No. 503,529
Claims priority, application Japan, Sept. 5, 1973, 48-99927; Nov. 14, 1973, 48-128016; Dec. 14, 1973, 48-144010[U]; Dec. 14, 1973, 48-140685
Int. Cl.[2] G10H *1/02;* H01P *1/22*
U.S. Cl. 84—1.27 13 Claims



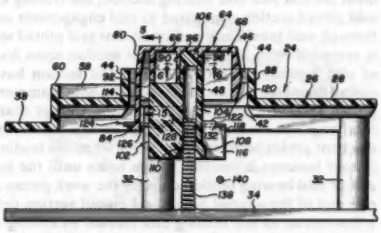
1. An electronic musical instrument comprising means defining at least one tone signal path for passing a tone signal therethrough, said path including an output terminal and an expression control circuitry, said circuitry having a first variable impedance element for selectively varying the level of the tone signal passing through said path and a variable impedance network, said variable impedance network being connected to said first variable impedance element for adjusting, independently of the variation of said level, the variation range of the tone signal at said output terminal.

3,965,791

STOP TABLET ASSEMBLY

Howard M. Thomas, North Tonawanda, and Richard A. Borowiec, Grand Island, both of N.Y., assignors to The Wurlitzer Company, Chicago, Ill.

Filed June 19, 1974, Ser. No. 481,114
Int. Cl.[2] G10B *3/10;* G10H *1/00*
U.S. Cl. 84—343 12 Claims

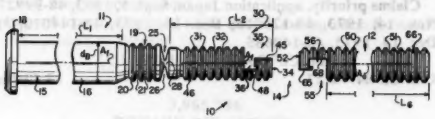


1. In an electronic musical instrument, the combination comprising a stop tablet assembly including a base, means on said base for receiving a stop tablet and including pivotal mounting means, a stop tablet, pivot means on said stop tablet cooperable with said pivotal mounting means rockably to mount said stop tablet on said base, and spring means acting between said base and said stop tablet and engaging said stop tablet below said pivot means to simultaneously bias said stop tablet pivot means against said pivotal mounting means, secure said stop tablet to said base, and provide an overcentering action to rocking of said stop tablet.

3,965,792
SPLIT PINTAIL FASTENER ASSEMBLY

John O. King, Jr., 3990 N. Ivy Road, Atlanta, Ga. 30342

Filed Jan. 17, 1975, Ser. No. 542,074
Int. Cl.[2] F16B *19/05*
U.S. Cl. 85—7 4 Claims



1. A fastener assembly adapted to be installed through prescribed diameter aligned holes in work pieces having a prescribed combined thickness by pulling the assembly into position with a lockbolt installation gun comprising:

an elongate fastener having a fastener central axis and a leading end, and including a bearing section concentrically oriented about said central axis and having a bearing diameter larger than the prescribed hole diameter so that the bearing section must be forced into the holes and be in bearing contact with the holes through the work pieces, said bearing section having a first prescribed length substantially equal to the combined thickness of the work pieces; a head at one end of said bearing section adapted to engage the work pieces when said fastener is installed through the aligned holes; an engagement section at that end of said bearing section opposite said head concentrically oriented about said central axis coaxially with said bearing section and adapted to be engaged to hold said fastener in place in the work pieces, a frangible breakneck section at the leading end of said engagement section opposite said bearing section concentrically oriented about said central axis coaxially with said engagement section and said bearing section and having a prescribed reduced breakneck diameter substantially smaller than said bearing diameter to form a first minimum prescribed cross-sectional area which causes said breakneck section to fracture upon a prescribed axial load exerted thereon by the lockbolt installation tool; and a generally cylindrical pintail section having a leading end and a trailing end adapted to be engaged by the lockbolt installation gun leading said engagement section and concentrically oriented about said central axis coaxially with said engagement section and said bearing section, the trailing end of said pintail section connected to said engagement section through said breakneck section so that said pintail section is removed from said engagement section upon fracture of said breakneck section, said pintail section having a pintail diameter at least as small as the hole diameter, said pintail section having a second length shorter than said first length so that the leading end of said pintail section does not protrude through the holes when the leading end of said fastener is inserted in the holes until the leading end of said bearing section engages the work pieces about one end of the aligned holes, said pintail section defining a first recess at the leading end thereof extending transversely of said central axis along a chord of said pintail section, said first recess opening onto the leading end of said pintail section and along the periphery of said pintail section, said first recess having a depth less than one-half of said pintail diameter and a first prescribed pintail recess length from its leading end to its trailing end, said pintail section further defining a first channel therein transversely extending across said pintail section and having a trailing end and a leading end, said first channel opening into said first recess adjacent the trailing end thereof, said pintail section further comprising a driven shoulder at the leading end thereof defined by said first recess and said first channel, said driven shoulder adjacent said first channel at the leading end of said first channel, and said pintail section further comprising a first spacer section extending across said first channel opposite said first recess and connecting said driven shoulder to the remainder of said pintail section, said first spacer section having a second minimum prescribed cross-sectional area greater than said first prescribed cross-sectional area of said breakneck section to prevent fracture of said first spacer section prior to fracture of said breakneck section under axial loading; and,

a generally cylindrical pintail extension coaxially aligned with the leading end of said pintail section having a leading end and a trailing end adapted to be engaged by the lockbolt installation gun, said pintail extension concentrically oriented about a second central axis coaxial with said first central axis, said pintail extension having an extension diameter at least as small as the hole diameter, said pintail extension having a third length so that the leading end of said pintail extension protrudes through the holes when the leading end of said fastener is inserted in the holes until the leading end of said bearing section engages the workpieces about one end of the aligned holes, said pintail extension defining a second recess at the trailing end thereof extending transversely of said second central axis along a chord of said pintail extension, said second recess opening onto the trailing end of said pintail extension and along the periphery of said pintail extension, said second recess having a depth less than one-half of said extension diameter and a second prescribed pintail recess length from its leading end to its trailing end substantially equal to said first recess length, said pintail extension further defining a second channel therein transversely extending across said pintail extension and having a trailing end and a leading end, said second channel opening into said second recess adjacent the leading end thereof, said pintail extension further comprising a driving shoulder at the trailing end thereof defined by said second recess and said second channel, said driving shoulder adjacent said second channel at the trailing end of said second channel, and said pintail extension further comprising a second spacer section extending across said second channel opposite said second recess and connecting said driving shoulder to the remainder of said pintail extension, said second spacer section having a third minimum prescribed cross-sectional area greater than said first prescribed cross-sectional area of said breakneck section to prevent fracture of said second spacer section prior to fracture of said breakneck section under axial loading, said driving shoulder in said first channel and said driven shoulder in said second channel so that the exertion of an axial load on said pintail extension exerts an axial load on said fastener to force said fastener into said holes

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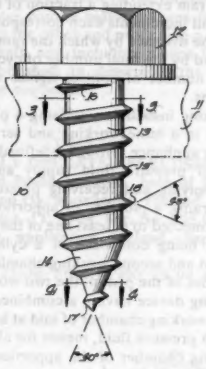
3,965,793
PARTICLEBOARD SCREW

Kenneth L. Roser, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

Continuation of Ser. No. 205,836, Dec. 8, 1971, abandoned.
This application Oct. 18, 1973, Ser. No. 407,424
Int. Cl.[2] F16B *25/00*
U.S. Cl. 85—41 1 Claim

1. A threaded fastener formed by roll thread methods for use in particleboard and similar materials comprising a cylindrical shank having a driving head at one end and a gimlet-type point at the opposite end, said point having an included angle of about 40° and a helical thread on the shank and point of constant depth except where the thread merges into the shank adjacent the head, said thread having a generally sharp crest with an included angle of approximately 48° and a substantially cylindrical and relatively wide root between each thread turn with the ratio of root diameter to pitch being substantially in the range of 1.2 to 1.6 and varying substantially uniformly and inversely as the ratio of the major diame-

ter to the root diameter varies in the range of 1.5 to 1.7, said thread having a constant depth on the point with a decreasing



major diameter and a thread crest with an approximately 48° included angle.

3,965,794

EXPANDABLE PLUG

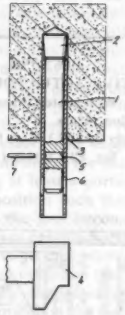
Roger Dorgnon, Avenue de St. Romains de Lerps 07130, Saint Peray, France

Filed Mar. 10, 1975, Ser. No. 557,212

Claims priority, application France, Mar. 13, 1974, 74.08467

Int. Cl.² F16B *13/06*

U.S. Cl. 85—77 **5 Claims**



1. An expandable plug for use as an attachment point for a cable or the like comprising a cylindrical socket member, one end of said socket member being split to form at least one joint which expands into tight engagement with the wall of a hole formed in a supporting material to set the plug in the supporting material, a male member located in said socket, means on at least one of said members for causing expansion of said one end of said socket member upon relative axial movement of the members in one directon to set the plug, at least one of said members being provided with a diametrical hole for reception of a cable or the like, said members each being predetermined lengths such that one of the members prevents a cable or the like from being passed through said hole until a predetermined amount of relative axial movement sufficient to set the plug in said one direction has taken place between said members.

3,965,795

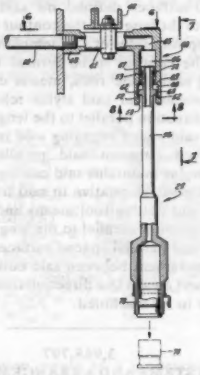
BREECH CARTRIDGE REMOVER

Arthur Collins, 1395 Stardust No. 5, Reno, Nev. 89503

Filed Mar. 22, 1974, Ser. No. 453,870

Int. Cl.² F41F *5/00*; B23P *19/00*

U.S. Cl. 89—1.5 F **7 Claims**



6. Apparatus for removing expended cartridges from breeches of bomb rack explosive ejector devices comprising an air driven hydraulic pump providing a source of hydraulic power, coupling means providing communication between the hydraulic source and the forward end of a breech, said coupling means including a flexible high pressure conduit and an adapter for removably connecting to the forward end of the breech, and said breech being adapted to have a cartridge in the rearward end thereof, said coupling means being adapted to deliver liquid under pressure from the hydraulic pump to against the interior end of the cartridge.

3,965,796

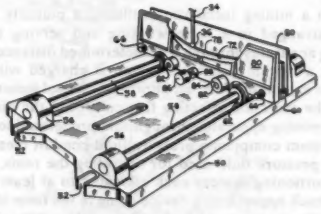
MACHINE TOOL TRACER CONTROL SYSTEM

Cecil J. Putnam, Jr., Union City, Mich., assignor to Putnam Pattern & Engineering Co., Coldwater, Mich.

Filed Dec. 5, 1974, Ser. No. 545,009

Int. Cl.² B23C *1/16*

U.S. Cl. 90—13 R **5 Claims**



1. A machine tool tracer control system for machining three-dimensional contours having a uniform transverse cross section throughout the length thereof comprising, in combination, a machine tool having cutting tool means and work support means, drive apparatus producing relative movement between said cutting tool means and said work support means in the direction of the length of the contour to be formed and transversely thereto, a servo-motor tracer control fixed with respect to one of said means having a universally movable template engaging stylus connected to and controlling operation of said drive apparatus, a template support fixed with respect to the other of said means, linear elongated guide rods

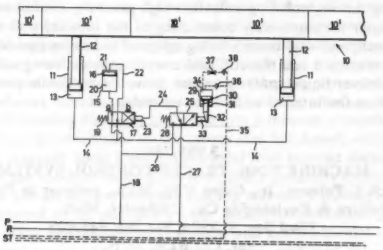
mounted upon said template support disposed parallel to the length of the contour to be formed, a template carriage movably mounted upon said guide rods for movement in the direction of the length thereof, a template mounted upon said carriage having a contour defined thereon corresponding in cross section to the contour to be machined, a pair of parallel planar spaced surfaces defined on said template carriage perpendicular to the length of the contour to be machined and disposed on opposite sides of said template in the direction of the plane of the contour to be formed for positioning said carriage along said guide rods, means engaging said stylus preventing movement of said stylus relative to said tracer control in the direction parallel to the length of the contour to be machined, said stylus engaging said template and closely slidably received between said parallel spaced surfaces whereby said stylus maintains said carriage and template in a predetermined position relative to said tracer during relative movement of said cutting tool means and said work support means in the direction parallel to the length of the contour to be machined, said parallel spaced surfaces and stylus permitting relative movement between said cutting tool means and said work support means in a direction transverse to the length of the contour to be machined.

3,965,797

CONTROL SYSTEMS AND ARRANGEMENTS FOR USE IN MINERAL MINING INSTALLATIONS

Hans Theodor Grisebach, Unna, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Westphalia, Germany

Filed Dec. 10, 1973, Ser. No. 423,483
Int. Cl.² F15B *13/04*
U.S. Cl. 91—32 **17 Claims**



1. In a mining installation utilizing a plurality of shifting rams arranged in a mine working and serving to displace mining apparatus through a predetermined distance, each ram having a working chamber which is charged with pressure fluid to extend the ram; an improved control system for operating the rams and effecting fine control of the displacement of the mining apparatus through said predetermined distance, said system comprising pressure fluid conduit means for supplying pressure fluid used for operating the rams, a plurality of apportioning devices each allocated to at least one of the rams, each apportioning device being in the form of a cylinder containing a piston and first and second working chambers in the cylinder on either side of the piston, means for alternately connecting the first working chamber of each apportioning device to the pressure fluid supply conduit means and the second working chamber of each apportioning device to the working chamber of the at least one associated ram and vice versa, actuating means for causing the connecting means to cycle, control signal means for producing and transmitting successive control signals to the actuating means to repetitively cycle the connecting means to cause the associated apportioning device to cyclically move its piston back and forth to expel two predetermined non-variable quantities of pressure fluid from the working chambers of the apportioning device through the connecting means to the working chamber of the at least one associated ram, the quantities of pressure fluid for each cycle producing a collective volume of pressure fluid which is a fraction of the volume of fluid necessary to displace the mining apparatus through the said predetermined distance, each ram extending a fraction of the predetermined distance in small increments each corresponding to one cycle of operation, the distance by which the ram is extended being finely controlled by the total number of cycles which is determined by the number of control signals transmitted to the actuating means.

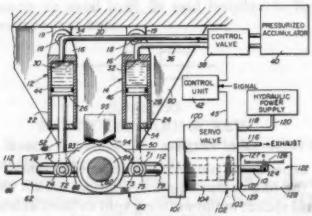
11. In a mining installation utilizing a plurality of shifting rams arranged in a mine working and serving to displace a mineral cutting appliance through a defined cutting depth, the combination of pressure fluid supply and return conduit means for supplying and receiving pressure fluid used for operating the rams, a plurality of apportioning devices each operatively connected to at least one of the rams, each apportioning device being composed of a cylinder containing a piston with first and second working chambers in the cylinder on opposite sides of the piston, the two working chambers of the apportioning device having a combined volume which is smaller than a working chamber of said at least one ram which is charged with pressure fluid, means for alternately connecting one working chamber of the apportioning device to the working chamber of said at least one ram and for connecting the other working chamber of the apportioning device to the pressure fluid supply means, the apportioning device feeding non-variable quantities of pressure fluid in successive doses to the working chamber of said at least one ram, each dose of pressure fluid being a fixed incremental fraction of the quantity of fluid necessary to displace the mineral cutting appliance through a distance corresponding to the defined cutting depth of the appliance, means for producing separate control signals, actuating means energized by the control signals for causing the connecting means to perform repetitive connecting cycles in accordance with the number of control signals received by the actuating means to thereby cause the associated apportioning device to transfer doses of fluid to the working chamber of said at least one ram to extend the ram through successive increments each corresponding to one dose of fluid.

3,965,798

ADAPTIVE ACTUATOR SYSTEM

Raymond J. Estlick, Winchester, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed July 2, 1973, Ser. No. 376,051
Int. Cl.² F01B *1/00*
U.S. Cl. 91—172 **11 Claims**



1. An adaptive actuator system adaptive to a variable load, and comprising:

a rotatable shaft disposed for coupling to the load and having a rotational bias applied thereto;

variable torque biasing means coupled to the shaft for cooperating with the load and providing a torque for rotating the shaft in a complying angular direction;

variable counter torque biasing means including an adjustable moment arm coupled to the shaft for opposing rotation of the shaft in said complying angular direction and

providing a proportional counter torque for rotating the shaft in the opposing angular direction; and

torque control means coupled to the torque biasing means and the counter torque biasing means for varying one with respect to the other and producing a preferred rotation of the shaft, and including means for sensing the rotation of the shaft to determine the magnitude of counter torque required.

3,965,799

HYDRAULICALLY OPERATED PERCUSSION DEVICE

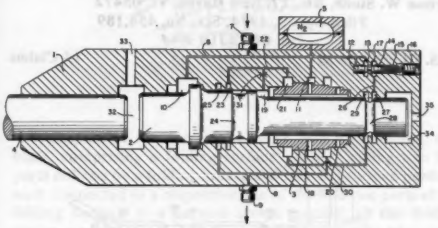
Esko Juvonen, and Pentti Virtanen, both of Lahti, Finland, assignors to Roxon Oy, Messilantie, Finland

Filed Sept. 11, 1974, Ser. No. 505,028

Claims priority, application Finland, Sept. 14, 1973, 2866/73

Int. Cl.² F01B *25/04*; **F01L** *17/00, 25/04*; **F01B** *7/18*

U.S. Cl. 91—220 **2 Claims**



1. Improvement in a hydraulically driven percussion device of the type for operation from a source of high pressure fluid and comprising a piston reciprocally movable within a body for striking against a tool, said piston defining with reference to the body two cylindrical chambers within which the piston moves, one of which chambers continuously communicates with the high pressure fluid, and distribution means for alternatingly connecting the other of said chambers to the high pressure fluid supply and a low pressure fluid supply, wherein the improvement comprises means for venting both ends of the piston to the low pressure fluid supply, said distribution means being located within one of the chambers and comprising a sleeve surrounding at least a portion of said piston, in order to move into a position such that movement of the piston directed towards the tool becomes possible, is controlled by means of grooves provided in the piston and in the body when the piston is in its end position farthest removed from the tool and only on condition that the pressure of the high pressure fluid supply exceeds a pressure set with an adjustable means incorporated in the body.

3,965,800

WATER POWERED DRIVE FOR AUTOMATIC CONTROLLERS

Edwin J. Hunter, Riverside, Calif., assignor to The Toro Company, San Marcos, Calif.

Division of Ser. No. 418,309, Nov. 23, 1973, which is a division of Ser. No. 190,528, Oct. 19, 1971, Pat. No. 3,827,459. This application Dec. 5, 1974, Ser. No. 529,698

Int. Cl.² F01B *25/06*

U.S. Cl. 91—336 **7 Claims**

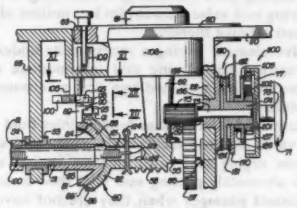
1. A drive means for operating an automatic controller apparatus having a power input shaft, comprising:

water powered means for receiving water under varying pressure from a source thereof and having a member driven by the force of said water thereon, said water powered means including means for supplying water to and exhausting water therefrom;

power transmission means for driving said controller apparatus shaft in response to movement of said member under the action of said water;

means for regulating the supply of water under said varying pressure to said water powered means for providing a virtually constant speed drive to said apparatus input shaft; and

speed control means for automatically controlling the speed of driving of said controller apparatus shaft under the forces of said water powered means acting through said



power transmission means to a predetermined rate by controlling said water regulating means, said speed control means including an escapement mechanism having a shaft having a maximum speed, means for driving said escapement mechanism shaft from said power transmission means responsive to the speed thereof, and control means movable in response to speed of said transmission means in excess of the maximum speed determined by the escapement mechanism and operatively connected to said water regulating means.

3,965,801

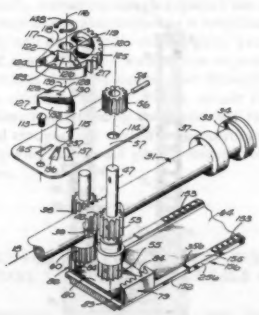
STRAIGHT LINE ABRADING TOOL

Alma A. Hutchins, 49 N. Lotus Ave., Pasadena, Calif. 91107

Division of Ser. No. 498,534, Aug. 19, 1974, Pat. No. 3,932,963. This application Jan. 27, 1975, Ser. No. 544,267

Int. Cl.² F01L *31/18*; **F16K** *31/16*

U.S. Cl. 91—351 **14 Claims**



1. Apparatus comprising:

a structure reciprocable by pressure fluid alternately admitted to two different chambers;

means forming a surface containing fluid passing valving apertures;

an actuating part mounted for limited rotary oscillating movement about a predetermined axis and near said surface;

a valve element slidable across and relative to said surface in a relation controlling the fluid flow through said apertures to produce said reciprocation, and connected to siad actuating part for oscillation thereby;

said actuating part being free from limited turning movement about said axis relative to said valve element so that upon movement in each rotary direction said part first turns through a predetermined angle without displacing said valve element and then turns through a further angle with the valve element to shift it relative to said surface and apertures;

said apertures including two circularly spaced apertures communicating with said two chambers respectively to deliver pressure fluid thereto, and a circularly intermediate aperture communication with the atmosphere;

said actuating part containing a confining recess loosely receiving said valve element for lost motion of the actuating part relative thereto;

said valve element having a recess at its underside facing said surface for placing said intermediate aperture in communication with said two first mentioned apertures alternately;

a pressure fluid inlet passage leading inlet fluid to a side of said valve element facing away from said surface in a relation urging said valve element against said surface while alternately passing said inlet fluid to said two first mentioned passages when they are not covered by the valve element;

a gear unit having teeth engagable by said reciprocable structure to turn the gear unit about a second axis in response to reciprocation of said structure;

said gear unit having additional teeth engaging said actuating unit;

said actuating unit being a gear sector having teeth meshing with said last mentioned teeth of the gear unit to turn the actuating part about said first axis in response to turning movement of said gear unit about said second axis.

3,965,802

HYDRAULIC DRIVE FOR OPERATING AN ELEVATOR

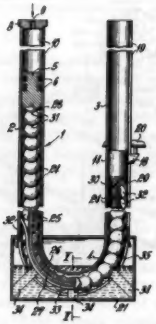
Max Jacobs, 179 Wittkullerstrasse, Solingen-Wald, Germany

Filed Nov. 26, 1973, Ser. No. 419,159

Claims priority, application Germany, Nov. 27, 1972, 2258065

Int. Cl.[2] F16J 1/10

U.S. Cl. 92—84 **15 Claims**



1. Elevator hydraulic drive means adapted for disposition inside the shaft of the elevator on one side of the load-lifting member thereof, said drive means comprising:

a. a hydraulic ram cylinder including a pair of vertical straight cylinder portions, and an arcuate bend portion connecting the lower ends of said straight cylinder portions, a first one of said straight cylinder portions extending up the path of ascent of the load-lifting member and having an axial slot in the wall thereof;

b. a hydraulic ram piston slidably mounted in the other straight cylinder portion;

c. a carrier body slidably mounted in said first straight cylinder portion and including a carrier arm that extends radially outwardly through said slot and supports the load-lifting member of the elevator;

d. universally flexible thrust-transmitting strand means cooperating at one end with said piston for transmitting thrust force in a direction parallel to and transverse to the axis of the cylinder portions, said strand means extending through said arcuate bend portion and cooperating at its other end with said carrier body; and

e. said piston being movable in opposing directions within said other straight cylinder portion causing corresponding movement of the carrier body in opposing directions within said first straight cylinder portion.

3,965,803

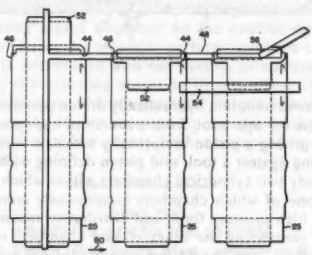
METHOD OF FORMING REINFORCED CARTON

Orison W. Stone, Rte. 17, New Haven, Vt. 05472

Filed Apr. 5, 1974, Ser. No. 458,189

Int. Cl.[2] B31B 7/14

U.S. Cl. 93—36 M **14 Claims**



3. A method for forming a tubular carton having a pair of opposed first walls, a pair of opposed second walls, and a reinforcing panel extending between said first walls, comprising:

providing a carton blank including a pair of first walls and a pair of second walls, alternatively hingedly connected together, and further including

a reinforcing panel hingedly connected to one end of said carton blank adjacent to one first panel but separated from said one first panel, said reinforcing panel having a glue flap at a free side thereof and another glue flap at a hinged side thereof;

folding said reinforcing panel, at its hinged connection, over on top of said carton blank and gluing the free side glue flap to one of said first walls;

parting said hinged connection between said reinforcing panel and carton blank;

erecting said carton blank into a carton including gluing said hinged side glue flap to the other one of said first walls; and

wherein said parting step includes folding said reinforcing panel over a flat blade having a portion that angles off with a sharp edge at the angle and moving said carton blank past said sharp edge such that said edge cuts through said hinged connection of said reinforcing panel.

3,965,804

CONTAINER ERECTION APPARATUS

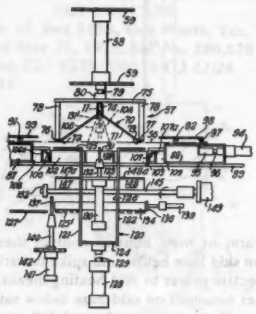
Peter Ellice Elford, 3 Wincroft Road, Caversham, Reading, Berkshire, England

Filed June 13, 1974, Ser. No. 479,053

Claims priority, application United Kingdom, June 14, 1973, 28384/73

Int. Cl.² B31B 1/46

U.S. Cl. 93—51 HW **7 Claims**



1. Apparatus for erecting a blank into a container, said blank comprising a folding surface portion having two like parts defined by a folding crease and two end surface portions each connected to a respective one of the said two parts of the folding surface at a second crease parallel to the folding crease, each of the end surface portions including edge parts connected at creases and which, when erected, cause the end portions to form end tray parts of the container, said apparatus comprising:

a. means for supporting the blank in a desired, substantially horizontal position;

b. erection means for causing the two parts of the folding surface to pivot towards one another about the folding crease as the end surface portions remain substantially horizontal, said erection means having an elongated crease breaker disposed below the desired position of support of the blank and extending in a direction parallel with and below the folding crease, and means for moving said crease breaker upwardly;

c. a die disposed below said desired position of the blank; and

d. movement means for moving the partly erected blank downwardly through said die to a container discharge position to erect said edge parts of said end surface portions to form said end tray parts, said movement means having a forming head disposed above said desired position of support of the blank and having a recess defined in a lower surface thereof to accommodate the upward movement of said crease breaker and the folding crease, said recess in the forming head being terminated at its lower edges on either side of the folding crease with corners adapted to facilitate breaking of said second creases on upward movement of the folding crease, and means for moving said forming head downwardly.

3,965,805

SPRAY FINISHING TUNNEL

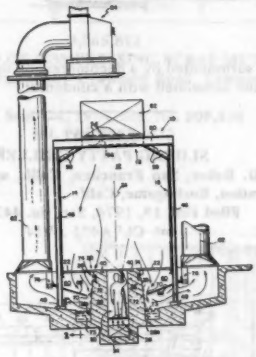
James H. Muehlbauer, Evansville, Ind., assignor to George Koch Sons, Inc., Evansville, Ind.

Filed June 9, 1975, Ser. No. 584,721

Int. Cl.² F23J 11/12

U.S. Cl. 98—115 SB **16 Claims**

1. A spray-finishing system including a tunnel through which objects to be finished longitudinally move, said tunnel having a pair of spaced longitudinal side walls, a floor defined, at least in part, by a grill through which air moves, means for distributing air within said tunnel and onto the objects being sprayed, means defining a chamber under said tunnel and in communication with said tunnel through said grill, and means for exhausting said chamber, in which the improvement comprises longitudinally extending means for dividing said chamber into lateral subchambers from which air is exhausted by said exhausting means, said dividing means providing, for each subchamber, a longitudinally and downwardly extending wall surface having a lower extremity, each subchamber including



a longitudinally extending trough adjacent the lower extremity, each subchamber also including a longitudinally extending, inwardly and downwardly sloping panel providing a distal edge spaced apart from said wall surface to provide a longitudinally extending, laterally narrow slot through which the air drawn from said subchamber moves, means for supplying a film of washing liquid flowing down said wall surfaces respectively to said troughs, and means for supplying a film of washing liquid flowing down said panels respectively toward said wall surfaces.

3,965,806

APPARATUS FOR BOILING, COOKING, STEAMING AND STERILIZING LIQUID, PORRIDGE-LIKE OR LUMPY FOOD

Manfred Brunner, Detmold-Bentrup, and Horst Knochenhauer, Lage-Lippe, both of Germany, assignors to H. Wolff Apparatebau K.G., Lage-Lippe, Germany

Filed Feb. 5, 1975, Ser. No. 547,298

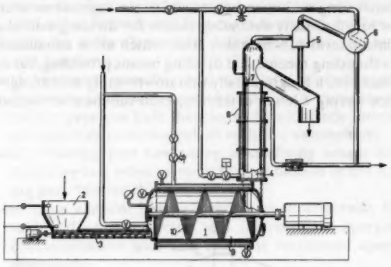
Claims priority, application Germany, Feb. 7, 1974, 2405807

Int. Cl.² A47J 27/66

U.S. Cl. 99—331 **7 Claims**

1. Apparatus for boiling, cooking, steaming, simmering and sterilizing liquid, porridge-like or lumpy food, comprising a cooker in the form of a cylindrical vessel having entry and exit openings for a material that is to be treated, and a conveying screw in its interior, the entry into said vessel being through

a feed screw of which the rear end is sealed, whereas the exit opening at the other end of said vessel communicates with a



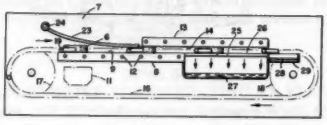
riser pipe surmounted by a decompression device in the form of a cyclone associated with a condenser.

3,965,807

SLIDING PATTY GRILLER

Edward D. Baker, San Francisco, Calif., assignor to N.P.I. Corporation, Burlingame, Calif.

Filed Feb. 19, 1974, Ser. No. 443,253
Int. Cl.² A47J *27/14*
U.S. Cl. 99—375 **5 Claims**



1. A sliding patty griller for cooking patties having a frame defining a front and a rear, comprising:

a lower stationary heated platen on said frame at the front thereof and having a substantially planar upper heated surface;

an upper stationary heated platen on said frame at the rear thereof and having a substantially planar lower heated surface, said heated surfaces being substantially parallel and vertically spaced apart with the front portion of said upper platen overlying the rear portion of said lower platen;

heating means for said platens to provide opposed cooking surfaces for said patties

a foraminous support means extending rearwardly from said lower platen below the rear portion of said upper platen; and

conveyor means having laterally extending pusher bars thereon arranged to move from the front to the rear of said griller, between said platens; whereby to slide patties over the front portion of said lower platen, then between said platens, then over said support means below the rear portion of said upper platen.

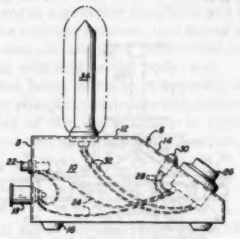
3,965,808

INTERNAL BUN TOASTER

Albert Etienne Chomette, Forest Hills, N.Y., assignor to Francis J. Fajella, Great Neck, N.Y., a part interest

Filed Aug. 7, 1975, Ser. No. 602,648
Int. Cl.² A47J *37/08*
U.S. Cl. 99—419 **12 Claims**

1. An internal bun toaster comprising a base cabinet open only downwardly, said cabinet having a smooth upper and side exterior with no depressions therein, a toasting spike extending upwardly from the highest plane of said base, and having a smooth surface with no depressions therein, said spike having a sharp edge or point at its uppermost extent that will readily penetrate the interior of a bun placed longitudinally down over said spike, said spike being shaped to extend throughout a substantial portion of the largest interior plane of said bun, electrical heating means imbedded in said spike and capable of heating the exterior surface of said spike suffi-



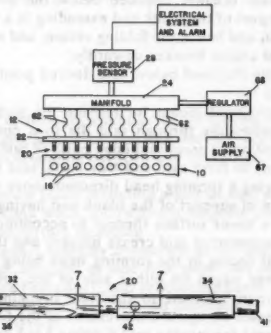
cient to warm or toast buns in contact therewith, a switch mounted on said base below said spike to variably control the input of electric power to said heating means, a hooded electrical socket mounted on said base below said spike adapted to prevent collection of crumbs and dirt, and electrical connections between said socket, switch and spike located within the interior of said base.

3,965,809

FRUIT PITTING APPARATUS

William E. Kieldsen, 2562 Borgum, NE., Grand Rapids, Mich. 49505, and Raymond J. Mieras, 3702 Kalamazoo, SE., Grand Rapids, Mich. 49508

Continuation of Ser. No. 270,967, July 12, 1972, abandoned, which is a continuation-in-part of Ser. No. 121,031, March 4, 1971, abandoned. This application July 18, 1974, Ser. No. 489,503
Int. Cl.² B23B *47/24*; A23N *4/02*
U.S. Cl. 99—492 **6 Claims**



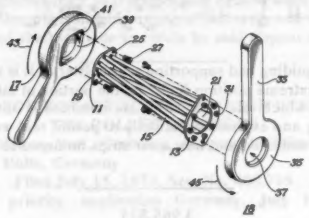
1. A pitting apparatus comprising:

a two-section pitting needle having a tip section and a shank section, said sections being joined together at a junction, said shank section having a fluid passageway therein communicating with the junction of said sections;

said tip section and said shank section being telescopically joined together at said junction, said sections having fluid pressure inlet and outlet ports therein, said sections when in a first position isolating said inlet port from said outlet

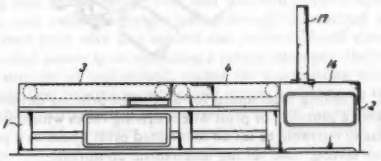
port and when in a second position providing an open fluid passageway between said inlet and said outlet ports;
a fluid pressure source connected to said passageway in said shank sections;
the fluid pressure within said passageway changing upon the occurrence of relative movement of said sections between said first and second positions at said junction; and
means for sensing such changes.

3,965,810
NUT CRACKER
Jess Miller, Rte. 13, Box 183B, Fort Worth, Tex. 76119
Filed May 27, 1975, Ser. No. 580,573
Int. Cl.² A23N 5/00; A47J 43/26
U.S. Cl. 99—581 **5 Claims**



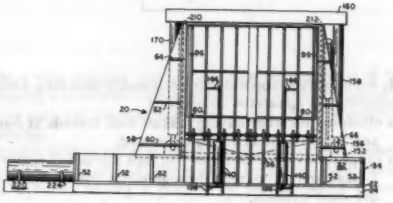
1. A nut cracker comprising:
back and front end plates, the front end plate having an aperture for the insertion of nuts to be cracked;
a plurality of elongated members, each of which is pivotally connected at its end portion to said plates;
said elongated members being spaced and disposed in an array defining together with said plates an enclosure for retaining a nut within;
so that rotating one plate with respect to the other constricts said enclosure to crack nuts.

3,965,811
APPARATUS FOR SUPPLYING OBJECTS TO BE BOUND TO AN AUTOMATIC BAND-BINDING MEANS
Shinroku Mae, Tokyo, Japan, assignor to Motosuke Umezu, Tokyo, Japan
Filed Aug. 8, 1975, Ser. No. 603,234
Claims priority, application Japan, Dec. 4, 1974, 49-139958
Int. Cl.² B65B 13/06, 13/18
U.S. Cl. 100—4 **5 Claims**



1. An apparatus for supplying objects to be bound to an automatic band-binding means, the apparatus comprising two groups of conveyers positioned at the same height, one of said groups of conveyers being arranged close to the automatic band-binding means; a push rod which reciprocates with respect to said automatic band-binding means; a pushing means fixed to the end of the push rod and provided with a pushing member disposed laterally of the push rod, said pushing member being adapted to take the position between the two groups of conveyers as its starting position and having springs which put it up higher than the conveyers during the movement of the push rod; a stopper means adapted to engage with the pushing means to hold it on a level with the conveyers as long as the push rod remains stationary; a plurality of selection means for band-binding positions located between the automatic band-binding means and the push rod at the different intervals corresponding to band-binding positions; means for reducing the running velocity of each selection means corresponding to the distance from the band-binding means with respect to the running velocity of the push rod; and means for stopping said selection means for band-binding positions when the object reaches a point just ahead of the automatic band-binding means; whereby said push rod is moved to supply the object to be bound to the automatic band-binding means and stopped at every stop position of said selection means to permit carrying out of band-binding.

3,965,812
METHOD OF COMPRESSING SCRAP METAL
Gordon D. Oberg, 20509 Crawford Road, Lynwood, Wash. 98036
Filed Sept. 24, 1974, Ser. No. 508,830
Int. Cl.² B30B 9/32
U.S. Cl. 100—39 **3 Claims**

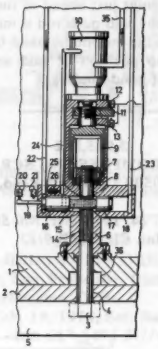


1. A method for operating an apparatus for processing scrap metal to compress the scrap metal and to increase the bulk density of said scrap metal, said apparatus comprising:
a. a moveable shear head;
b. a first wall and a second wall and a bottom support connecting said first wall and said second wall;
c. said first wall and said second wall being spaced apart to define a tunnel for receiving said shear head;
d. means to move said shear head with respect to said first wall and said second wall;
e. a first rotatable support juxtapositioned to said first wall;
f. a second rotatable support juxtapositioned to said second wall;
said method comprising:
g. positioning said first rotatable support on one side of said tunnel to support said scrap metal;
h. positioning said second rotatable support on the other side of said tunnel to support said scrap metal;
i. positioning said scrap metal over said tunnel and in a position to be supported by said first rotatable support;
j. moving said shear head toward said tunnel and into said tunnel to shear some of said scrap metal to form sheared scrap metal and to move said sheared scrap metal into said tunnel;
k. moving said shear head out of and away from said tunnel;
l. rotating said first rotatable support to allow said scrap metal to move to be in a position to be forced into said tunnel by said shear head; and,
m. moving said shear head toward said tunnel and into said tunnel to force said scrap metal into said tunnel.

3,965,813
ARRANGEMENT FOR THE ATTACHMENT OF A BODY TO A SUPPORT

Karl Pfost, Schanbach, Germany, assignor to Fritz Muller, Neckar, Germany

Filed May 7, 1975, Ser. No. 575,427
Claims priority, application Germany, May 16, 1974, 2423862; Mar. 27, 1975, 2513708
Int. Cl.² B30B *15/00*
U.S. Cl. 100—99 **13 Claims**



1. An improved apparatus for releasably attaching a body to a support, the apparatus comprising

a clamping member having a shaft with threads at one end and with a T-head at the other end,

a support having a recess in one face thereof to receive the T-head and an opening through which the clamping member shaft extends,

threaded means coupled to the clamping member, the said threaded means being rotatable to axially move the clamping member, and first drive means to rotate said threaded means, whereby the T-head is extendable beyond a surface of the support and is rotatable between clamping and releasing positions,

rotating means coupled to said shaft of said clamping member for rotating said member between its clamping and releasing position;

second drive means for driving said rotating means;

a source of power for said first and second drive means; and

control means for selectively controlling the application of power from said source to said first and second drive means to sequentially apply power to said second drive means and then to said first drive means when a body is being clamped to the support, and to simultaneously apply power to both of said first and second drive means when a body is being released.

3,965,814
REPLACEABLE WEAR STRIPS AND LINER FOR BALING PRESS

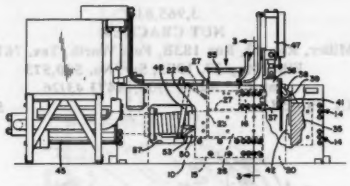
Nicholas L. Manko, Piqua, Ohio, assignor to The French Oil Mill Machinery Company, Piqua, Ohio

Filed Jan. 14, 1975, Ser. No. 540,800
Int. Cl.² B30B *15/04, 15/06*
U.S. Cl. 100—245 **6 Claims**

1. In a baling press having means defining a cavity with loading and unloading openings, a bolster movably supported in said cavity to reduce the volume of said cavity and compress material loaded thereinto, a ram connected to reciprocate said bolster within said cavity between predetermined retracted and advanced positions providing for loading of bulk material into the cavity with said bolster in its retracted position and compression of the material to a predetermined shape at said advanced position;

the improvement comprising wear strips removably mounted to said bolster at the face thereof normally located within said cavity,

means for moving said ram such that said bolster is moved beyond one of said retracted and advanced positions to an extreme position, and

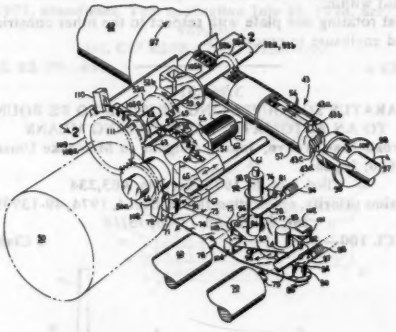


means guiding and supporting said bolster as it is moved to said extreme position such that the portion of said bolster upon which said wear strips are mounted is outside said cavity and exposed sufficiently to permit said wear strips to be removed and new wear strips mounted to said bolster.

3,965,815
SETTING MECHANISM FOR A POSTAGE PRINTING DEVICE

Raymond R. Lupkas, Trumbull, and Keith E. Schubert, Rowayton, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Sept. 16, 1974, Ser. No. 506,331
Int. Cl.² B41L *47/46*
U.S. Cl. 101—91 **3 Claims**



1. A setting mechanism for a postage printing device comprising a plurality of print wheel driving racks which are individually movable to set an associated print wheel to a postage value setting, said setting mechanism comprising:

a pair of spaced apart, nested, rotatably mounted shafts each having a pair of pinion gears mounted on one end thereof, and a pair of spur gears mounted on another end thereof, said pinion gears each being in operative engagement with a respective print wheel drive rack;

a stepper motor operatively connectable to each spur gear for rotatively driving each of said spur gears, so as to rotate the respective pinion gears to move said print wheel driving racks;

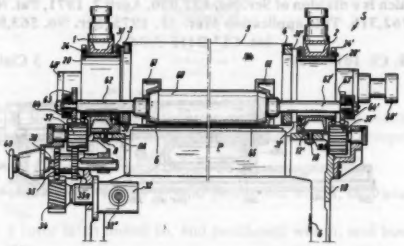
interconnectable means disposed between the stepper motor and said spur gears for interconnecting said stepper motor with each of said spur gears in a sequential manner, said interconnectable means comprising a splined shaft

rotatively connected to said stepper motor, a master gear rotative with, and slidably supported upon said splined shaft by means of a yoke, said yoke having two spaced apart elongated laterally disposed tooth profiles for locking the spur gears against rotation when said spur gears are not in rotative engagement with said master gear, said master gear being disposed within a mid-portion of said yoke such that teeth of said master gear cooperate with the tooth profiles on the yoke to form two continuous elongated teeth which slide through the respective spur gears and keep them locked against rotation until said master gear is positioned opposite a spur gear to be rotated, means operatively connected to said master gear and said yoke for causing said master gear and said yoke to slide upon said splined shaft, said master gear sequentially slidably engaging with each of said spur gears when said master gear and said yoke are caused to slide upon said splined shaft, said master gear causing each spur gear to rotate when slidably engaged therewith and when said splined shaft is made to rotate by said stepper motor.

3,965,816
DRIVE FOR ROTARY SCREEN PRINTER UTILIZING THE ROLLER SQUEEGEE

Mathias Mitter, Verl, Germany, assignor to Mitter & Co., Schloss Holte, Germany

Filed July 15, 1974, Ser. No. 488,719
Claims priority, application Germany, July 19, 1973, 2336734
Int. Cl.² B41F *15/10, 15/42*
U.S. Cl. 101—115 **19 Claims**

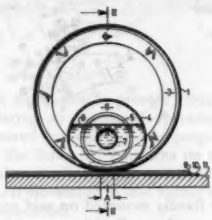


16. In a screen printing machine, a combination comprising a frame; first and second bearing members mounted in said frame; an elongated hollow stencil having first and second end portions rotatably supported by said first and second bearing members; a prime mover; a first power train drivingly connecting said prime mover with said first end portion of said stencil; and a second power train drivingly connecting said first power train with said second end portion of said stencil, said second power train including a rotary squeegee disposed in the interior of said stencil, means for transmitting torque from said first bearing member, and means including an idler gear which is freely rotatably mounted in said frame and is driven by said squeegee for transmitting torque from said squeegee to said second end portion of said stencil in the region of said second bearing member, said squeegee comprising coaxial first and second stubs which respectively extend into said first and second bearing members, said first power train comprising a first driving sleeve rotatable in said first bearing member, spacedly surrounding said first stub and operative to rotate said first end portion of said stencil, a first gear receiving torque from said prime mover and rotatably mounted in said frame, and a second gear rigid with said sleeve and meshing in the said first gear, said means for transmitting torque from said first power train to said squeegee comprising a third gear rigid with said first stub and meshing with said first gear, said means for transmitting torque from said squeegee to said second end portion of said stencil comprising a second driving sleeve rotatably mounted in said second bearing member, spacedly surrounding said second stub and operative to rotate said second end portion of said stencil, a fourth gear rigid with said second stub, said idler gear being rotatably mounted in said frame and meshing with said fourth gear, and a sixth gear rigid with said second sleeve and meshing with said idler gear.

3,965,817
CLOSED SQUEEGEE APPLICATOR WITH FLEXIBLE SIDES

Zeki Ipek, Brahmsgasse 4, A-9020 Klagenfurt, Austria

Filed Apr. 1, 1974, Ser. No. 456,768
Claims priority, application Austria, Apr. 3, 1973, 2922/73
Int. Cl.² B41F *15/40, 15/44*
U.S. Cl. 101—120 **3 Claims**



1. In a web printing, coating or coloring apparatus of the type having a stencil mounted for applying printing, coating or coloring material therethrough onto a web, the improvement comprising:

a flexible hollow metal cylinder, the interior of said cylinder being at least partially filled with a supply of said material;

said cylinder having a portion of the periphery thereof deformed by the weight of said contained material and being thereby pressed into contact with said stencil on the interior surface thereof opposite said web;

said cylinder periphery being perforated along a longitudinally extending strip in the area of contact between said cylinder and said stencil;

the peripheral width of said area of contact being at least as great as the peripheral width of said perforate strip; and

deformable members sealing the opposite ends of said cylinder.

3,965,818
PRESSURE CONTROL DEVICE FOR OFFSET PRINTING MACHINE

Koji Ishii, Fukuyama, Japan, assignor to Ryobi, Ltd., Hiroshima, Japan

Filed Mar. 28, 1975, Ser. No. 563,166
Claims priority, application Japan, Mar. 28, 1974, 49-35726[U]
Int. Cl.² B41F *7/06, 13/28*
U.S. Cl. 101—218 **7 Claims**

1. A pressure control device for an offset printing machine having a blanket cylinder comprising:

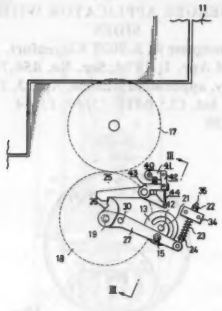
a pair of spaced apart side plates;

a pressure cylinder shaft having eccentric ends extending between said side plates, said shaft being pivotally mounted to said side plates;

a pressure cylinder rotatably mounted on said pressure cylinder shaft and having a periphery engageable with the blanket cylinder;

a cam driven pressure cylinder separating means having one end fixed to one end of said eccentric end to rotate said shaft, thereby changing the distance between said pressure cylinder and the blanket cylinder;

a pair of arms rotatably coupled at their respective ends to respective ones of said eccentric ends, said arms being pivotally mounted to respective ones of said side plates;
a pair of springs biasing respective ends of each of said pair of arms opposite said eccentric ends;
a pair of pins, one of said pair of pins extending transversely from respective ones of each of said pair of arms;
a cam shaft extending between said side plates and rotatably mounted in said side plates;



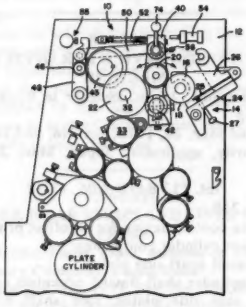
a pair of cams fixedly mounted on said cam shaft, the respective cam surface of said cams engaging respective ones of said pair of pins;
a dial mounted on one end of said cam shaft indicating the rotational position of said pair of cams;
a serrated wheel mounted on the other end of said cam shaft; and
a click mounted to engage the serration in said wheel to position said cam shaft, whereby rotation of said dial causes said pair of pins to move along said cam surfaces, thus pivoting said arm and moving the axial position of said pressure cylinder shaft.

3,965,819

INK DUCTOR SYSTEM

Dinesh G. Punater, Kettering, Ohio, assignor to Harris Corporation, Cleveland, Ohio

Filed Jan. 31, 1975, Ser. No. 545,778
Int. Cl.² B41F *31/10*
U.S. Cl. 101—350 **1 Claim**



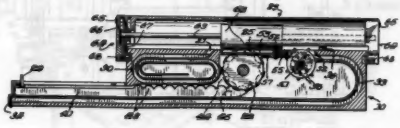
1. In an inker for a printing press having a fountain roll and a distributor roll mounted in spaced parallel relation, a ductor roll, pivotally mounted support arms carrying said ductor roll parallel to and between said fountain and distributor rolls, drive linkage connected to said arms to oscillate said ductor roll into contact alternately with said fountain and distributor rolls, throw off means operable on said drive linkage to prevent its moving said ductor roll into contact with said fountain roll, and an adjustable connection between said arms and said drive linkage to adjust precisely the area of contact between said ductor roll and said fountain roll;
the improvement comprising means incorporated in said adjustable connection to change the relative positions of said arms and said drive linkage temporarily without disturbing the setting of said adjustable connection whereby contact between said ductor roll and said distributor roll can be avoided during makeready periods,
said adjustable connection including
eccentric members having a circular stud portion forming a rotatable connection to said linkage and having a circular body portion offset from said stud portion,
bushings rotatably mounted in said arms and surrounding said body portions of said eccentric members,
a releasable connection between said bushings and said eccentric members defining a predetermined positional relation therebetween permitting temporary rotation between said bushings and said eccentric members, and
means clamping said bushings in said arms whereby said bushings and eccentric members can be rotated together and secured in an adjusted position defining the relation of said arms to said linkage.

3,965,820

METHOD FOR HIGH DENSITY RECORDING OF SOURCE CREDIT TRANSACTION DATA

Erdman O. Spradlin, 360 Green Acres Drive, Naperville, Ill. 60540

Continuation of Ser. No. 379,718, July 16, 1973, abandoned, which is a division of Ser. No. 132,050, April 7, 1971, Pat. No. 3,762,316. This application Mar. 31, 1975, Ser. No. 563,812
Int. Cl.² B41F *3/04*
U.S. Cl. 101—426 **3 Claims**



1. A method for recording data from each of a plurality of credit transactions, said data including characters comprising variable information, characters comprising fixed credit card information and customer signature information, onto a credit receipt and onto data paper successively advanceable to a plurality of linearly extending spaces, each of said linearly extending spaces having a height substantially equal to the height of said characters and being adapted to receive said data corresponding to one of said credit transactions, comprising the steps of:
a. providing adjustable recording means and setting them into correspondence with said variable information;
b. advancing a first portion of one of said linearly extending spaces of said data paper into alignment with said adjustable recording means;
c. aligning said fixed credit card information with a second portion of said one of said linearly extending spaces of said data paper;
d. providing a third portion of said one of said linearly extending spaces of said data paper adapted to receive customer signature information, said first portion, said second portion and said third portion of said data paper being aligned along said one of said linearly extending spaces;
e. moving said credit receipt into overlying relationship with said one of said linearly extending spaces of said data paper; and thereafter
f. simultaneously recording said variable information and said fixed credit card information respectively onto said

first portion and said second portion of said one of said linearly extending spaces of said data paper, and onto said credit receipt.

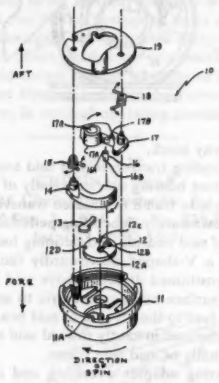
3,965,821
LOW SPIN-DECELERATION SAFING AND ARMING MECHANISM

William O. Maruska, Minnetonka, Minn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 392,379, Aug. 28, 1973, abandoned. This application Jan. 16, 1975, Ser. No. 541,484

Int. Cl.² F42C *15/22*

U.S. Cl. 102—79 **3 Claims**



1. A low spin and deceleration safing and arming mechanism adapted for use in the autorotating submunition comprising:

a. a housing;

b. a delay disc linked to, and positioned within, said housing;

c. a rotor latch linked to, and positioned within, said housing;

d. a lockweight linked to, and positioned within, said housing, with said lockweight disposed aft of said delay disc;

e. means for biasing said lockweight, with said means positioned within said housing;

f. a rotor interlock pin linked to said delay disc and positioned within said housing;

g. a rotor linked to said rotor interlock pin and positioned within said housing, with said rotor having an aperture therein and therethrough for carrying and containing a detonator;

h. means for biasing said rotor, with said means positioned within said housing;

i. and, a bearing plate positioned aft of said delay disc, said rotor latch; said lockweight, said lockweight biasing means, said rotor interlock pin, said rotor, and said rotor housing means, with said bearing plate linked to, and positioned within, said housing.

3,965,822
SHOULDER TAMPING LIFTING JACK

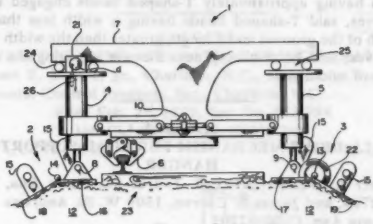
John Kenneth Stewart, Columbia, S.C., assignor to Canron, Inc., New York, N.Y.

Filed Nov. 11, 1974, Ser. No. 522,749

Int. Cl.² E01B *27/17*

U.S. Cl. 104—7 B **7 Claims**

4. A machine for aligning railroad track into a substantially correct position comprising: laterally and vertically adjustable clamping means adapted to grasp each of the rails of a railroad for purposes of track displacement when aligning track; a pair of contoured shoes, each one of said respective shoes being adapted to embrace a shoulder portion of the railroad ballast located on the outside of each respective rail which is to be aligned; a lifting jack articulately connected to each of said shoes adapted to provide a substantially vertical force to said



clamping means; and means to provide vibration to said contoured shoes during an alignment operation, each of said respective contoured shoes having an appropriate surface area whereby in use the force per unit area on said shoe is of a magnitude to substantially prevent said contoured shoe from vertical and lateral movement in said ballast when performing said alignment operation.

3,965,823
CONVEYORS

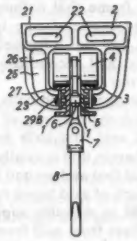
Pierre Bardot, Paris, France, assignor to Sucmanu, Paris, France

Continuation of Ser. No. 248,170, April 27, 1972, abandoned. This application Nov. 5, 1974, Ser. No. 521,211

Claims priority, application France, June 30, 1971, 71.23922

Int. Cl.² B61B *3/00;* **E01B** *25/26*

U.S. Cl. 104—91 **7 Claims**



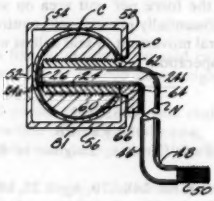
1. In a conveyer comprising two rails, supports holding said rails spaced apart near to each other and parallel to each other, said supports comprising pairs of downwardly extending arms and bolts carried by the lower ends of said arms, which bolts support the rails, each rail having a horizontal bearing surface and a vertical guiding surface, a load carrying device running on the rails in engagement with said bearing surface and said guiding surface, each rail having a groove in that face of the rail on which the guiding surface is formed, said groove extending along the rail, said groove opening at that side of said rail which is remote from the guiding surface, said groove being wider near the guiding surface than at the opening; the improvement which comprises forming each pair of said arms with inwardly projecting horizontal extensions at their lower ends, and forming each rail with at least three horizontal limbs and a vertical limb, said horizontal limbs being spaced apart from each other and connected at one end to the vertical limb; the first of said horizontal limbs having its

upper surface serving as said bearing surface and its underneath surface seating on the horizontal extension of one of said arms, the two other horizontal limbs (**12, 12A**) being of less depth horizontally than the first horizontal limb, a flange (**12B, 12C**) on the free end of each of said other horizontal limbs, said flanges extending towards each other so that said other horizontal limbs and said flanges form said groove; said bolts having approximately T-shaped heads engaged in the grooves, said T-shaped heads having a width less than the width of the grooves and a length greater than the width of the grooves, said bolts having nuts thereon engaging the lower ends of said arms.

3,965,824
BALL DRIVE MECHANISM FOR LOAD SUPPORTING HANGER

Robert J. Winkler, 2101 E. Fourth St., Santa Ana, Calif. 92704, and James B. Curran, 1509 W. St. Andrews Place, Santa Ana, Calif. 92705

Filed Dec. 4, 1974, Ser. No. 529,368
Int. Cl.² B65G *35/08*
U.S. Cl. 104—165 **11 Claims**



1. A mechanism for successively moving at least one load supporting first shaft of circular transverse cross section through a predetermined endless path, said mechanism including:

a. a hollow carrier frame that defines said predetermined endless path, said carrier frame having a first side in which an endless first slot is formed, said slot being situated between first and second longitudinally extending edges of said carrier frame;

b. a plurality of first and second balls disposed side by side in said frame, with the majority of said balls in abutting contact, each of said first balls having a diametrically extending bore therein that is axially aligned with said slot and normal to said first and second longitudinally extending edges, and each of said bores rotatably engaging one of said first shafts to movably support one of said load supporting members from said frame;

c. first means for retaining each of said first shafts in said bores;

d. second means for preventing transverse rotation of said first balls as said first balls move through said predetermined endless path said second means including a guide wheel rotatably supported on said first shaft, said guide wheel including a first circular portion disposed between said first and second longitudinal edges and a second portion of larger diameter than said first portion that is disposed between said first side and said third means that act as guides for said second portion to prevent said first portion from being disengaged from said slot defined by said first and second longitudinal edges;

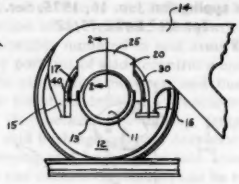
e. a wheel having a plurality of circumferentially spaced lobes thereon, said wheel projecting into the interior of said frame through an opening therein, and said lobes so spaced that when said wheel is rotated pairs of adjacent lobes removably and successively engage each of said first and second balls to move the engaged ball and the balance of said balls and said load supported first shaft through said predetermined endless path; and

f. power means for rotating said wheel.

3,965,825
RESILIENT TRUCK AXLE BEARING MOUNTING

James W. Sherrick, Edinboro, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Oct. 8, 1974, Ser. No. 513,187
Int. Cl.² B61F *5/28, 5/30, 5/38, 15/12*
U.S. Cl. 105—224.1 **3 Claims**



1. In a railway truck,

an axle extending transversely of said truck,

an anti-friction bearing carried axially of said axle,

an elongate side frame orientated transversely of said axle having downwardly depending pedestal jaws spaced fore and aft of said bearing and defining longitudinally therebetween a V-shaped downwardly facing load carrying surface positioned directly above said bearing, said load carrying surface being concentric to and about said axle from the fore to the aft side of said bearing with the apex thereof disposed inwardly toward said axle and extending longitudinally of said side frame,

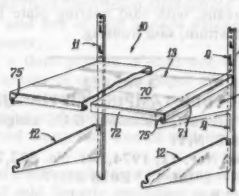
a rigid bearing adapter overlying and carried by and in contact with said bearing, said bearing adapter having a V-shaped upwardly facing load receiving surface spaced directly beneath and presented toward said load carrying surface of said side frame, said load receiving surface being concentric to and about said axle from the fore to the aft side of side bearing with the apex thereof disposed upwardly toward said axle and extending longitudinally of said side frame, said load receiving surface matingly receiving said load carrying surface in opposed relation thereto, and

a unitary semi-annular resilient elastomeric pad disposed in compression load carrying relation between said load carrying and load receiving surfaces, said pad conforming to and bearing on said load carrying and load receiving surfaces.

3,965,826
SHELVING STRUCTURE

Robert D. Markham, Peoria, Ill., assignor to H C Products Co., Princeville, Ill.

Filed May 5, 1975, Ser. No. 574,566
Int. Cl.² A47B *5/00*
U.S. Cl. 108—152 **6 Claims**



1. An off-wall shelving structure comprising: an elongated wall bracket mountable in vertical upright position over a

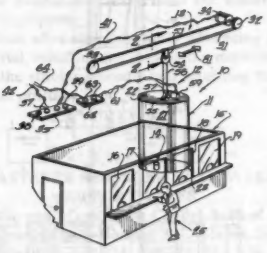
supporting wall and including a planar platform portion and a pair of parallel flange portions extending outwardly of the lateral margins of said platform portion to space the latter from said supporting wall, said platform portion having a plurality of uniformly spaced elongated openings therethrough; and a cantilever shelf supporting bracket attachable to said wall bracket comprising a planar body having an operationally disposed horizontal upper edge and a platform engaging rear edge at right angles thereto, a plurality of locking tongues projecting integrally from said rear edge of said body and each having a depending ear portion spaced from said rear edge by an intervening reduced throat section, said tongues being uniformly spaced and formed to enter a selected corresponding plurality of said openings simultaneously whereby to dispose said throat sections thereof within said openings and said ear portions behind said platform portion, said throat sections being laterally movable within said openings with at least one thereof formed to enter a laterally offset portion of its associated opening; and detent means on the periphery of said offset portion for interlocking engagement with said one said throat section whereby to prevent reverse lateral movement thereof and thereby removably lock said cantilever bracket in vertical operating position.

3,965,827

CRIMINAL TRAP

Tom Reeves, 1216 Circle St., Winchester, Va. 22601

Filed Dec. 2, 1974, Ser. No. 528,890
Int. Cl.² E05G *5/02*
U.S. Cl. 109—3 **3 Claims**



1. A criminal trap intended for use in banks and similar institutions and positioned forwardly of and spaced above a series of side-by-side tellers' windows, the trap comprising, in combination:

a hollow open bottom cylindrical cage body member manufactured of bullet proof material and having cylindrical side walls, a flat top end, and an open bottom end;

a hollow cylindrically shaped compartment defined interiorly of said cage body member opening out of the bottom end thereof and of a size and configuration adapted to readily envelope therein an individual over which the cage body member is lowered;

a pair of horizontally spaced apart tandemly disposed sprocket members each rotatively mounted about their axis and disposed in parallel relationship to each other and adapted to be rotatably mounted above opposite ends of the series of tellers windows;

an endless continuous chain trained over said sprockets and having an upper run and a lower run;

means for raising and lowering said cage body member in a vertical direction;

means affixing said vertical raising and lowering means to said chain for positioning said cage body member in a horizontal direction;

an electrical motor connected to the axis of one of said sprockets for drivingly moving said chain in selected opposite directions thereabout;

a multi-positioned electrical panel connected to said electric motor by suitably insulated electrical wiring and connected to a suitable source of electrical energy for selective control of said energization and de-energization of said electric motor for movement of said chain about said sprockets; and

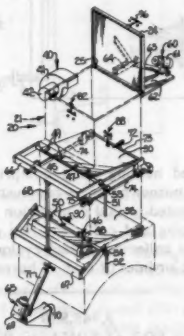
means for dispensing anesthetizing gas into said cage compartment upon the lowering of said cage body member.

3,965,828

WASTE FEEDING APPARATUS FOR INCINERATOR

Robert E. McRee, Jr., Charlotte, N.C., assignor to Environmental Control Products, Inc., Charlotte, N.C.

Filed Feb. 27, 1975, Ser. No. 553,794
Int. Cl.² F23G *5/00;* **F23M** *7/00*
U.S. Cl. 110—8 R **15 Claims**



1. In an incinerator including a combustion chamber for burning waste material and having an access opening in a top portion thereof for the introduction of waste material therein by gravity; the combination therewith of means for feeding material including pathological or highly infectuous wastes into the incinerator combustion chamber through the access opening for burning and being characterized by a construction which substantially prohibits the escape of fumes, smoke or particulate matter from the incinerator, said feeding means comprising:

generally vertically extending, enclosed, stationary, chute means mounted on the incinerator and having open top and bottom ends in which said bottom end is positioned in communication with the access opening in the incinerator combustion chamber for providing a generally vertically extending passageway for gravity flow of the waste material therethrough and into the incinerator combustion chamber;

selectively operable cover door means mounted on said chute means at said top end thereof for being opened to insert the waste material into said chute means and for being closed to cover and close said chute means at the top thereof; and

selectively operable interior door means mounted within said chute means below said cover door means for being closed to close the passageway through said chute means and for receiving and holding on the top surface thereof the waste material inserted into said chute means when said cover door means is opened and for being opened to allow gravity feeding of the waste material into the combustion chamber of the incinerator when said cover door means is closed;

whereby the escape of fumes, smoke or particulate matter from the incinerator is prohibited by said interior door means being closed when said cover door means is opened and said cover door means being closed when said interior door means is opened.

3,965,829

BOILER

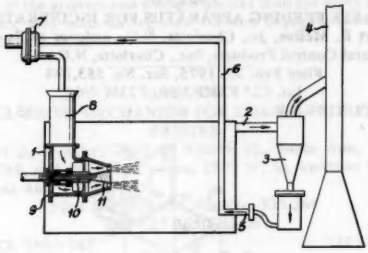
Byrom Lees, Kent, England, assignor to The British Petroleum Company Limited, London, England

Filed Feb. 3, 1975, Ser. No. 546,758

Claims priority, application United Kingdom, Feb. 25, 1974, 8372/74

Int. Cl.² F23C 1/10; F23J 5/02

U.S. Cl. 110—22 R **9 Claims**



1. An oil-fired heating plant comprising a combustion chamber, an oil burner having a combustion air inlet, said oil burner being located in said combustion chamber, a cyclone means for trapping and collecting flue dust and means for cycling flue dust collected in said cyclone means back into said combustion air inlet of said oil burner.

3,965,830

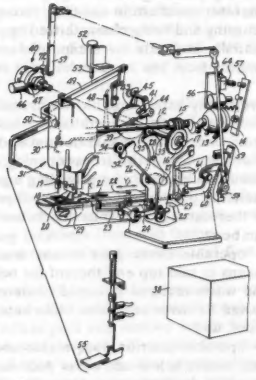
ASSEMBLY FOR AUTOMATIC BAR TACKING

Adolph Stephen Dorosz, Beverly, Mass., assignor to USM Corporation, Boston, Mass.

Filed Dec. 5, 1974, Ser. No. 530,048

Int. Cl.² D05B 19/00, 65/02

U.S. Cl. 112—121.11 **6 Claims**



5. In a bar tacking sewing machine having a needle bar drive shaft operatively connected through a clutch to a motor to provide reciprocating motion to a needle, a workpiece clamp constructed to releasably secure and support a workpiece under the needle said clamp being slidably and pivotably mounted on the sewing machine for movement relative to the needle along first and second axes, means for feeding thread to the needle including a nipper for releasably engaging the thread and a knife for engaging and cutting the thread when the sewing operation is completed, the improvement comprising:

a. a cam shaft rotatably mounted on the sewing machine transverse to the needle bar drive shaft and being operatively geared to said drive shaft for coordinated rotation therewith;

b. a cam mounted for free rotation on the cam shaft and having a cam slot constructed therein to provide movement for the thread cutting knife;

c. an electrically operated clutch fixed to the cam shaft and releasably engaging the cam to cause rotation of said cam on said shaft during selected portions of the sewing operation;

d. linkage means connected to the thread cutting knife and to the cam slot through a follower to cause movement of said knife according to the configuration of the slot; and

e. electronic control means for actuating the clutch to cause engagement of the cam to the cam shaft only during the initial and final portions of the sewing operation.

3,965,831

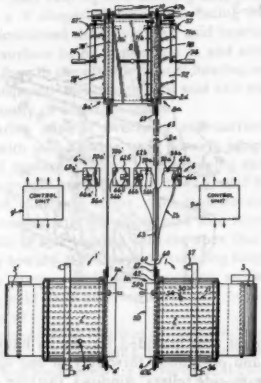
APPARATUS FOR CUTTING, SELVAGING AND/OR FOLDING SHEET MATERIAL

Henry John Weir, Udine, Italy, assignor to Sheldon P. Behn, Highland Park and Robert M. Behn, Wilmette, both of, Ill., part interest to each

Filed Aug. 5, 1974, Ser. No. 494,853

Int. Cl.² D05B 33/00

U.S. Cl. 112—121.15 **10 Claims**



1. In combination, a draping conveyor having a narrow upper margin over which individual flatwork pieces can be draped in longitudinally spaced relation with at least the lower portions thereof exposed, a sewing station positioned opposite a section of said draping conveyor, and a pair of sewing machines on the opposite lateral sides of said draping conveyor at said sewing station and positioned so that operators in front of said sewing machine may grasp respectively the two exposed portions of the flatwork piece hanging down from the upper margins of said draping conveyor.

3,965,832

METHOD OF CONTOUR SEWING

Robert B. Egtvedt, Comstock Park; Theodore C. Zwiep, Grand Rapids, and John R. Den Bleyker, Holland, all of Mich., assignors to Wolverine World Wide, Inc., Rockford, Mich.

Division of Ser. No. 339,776, March 12, 1973, Pat. No. 3,871,306. This application Nov. 20, 1974, Ser. No. 525,737

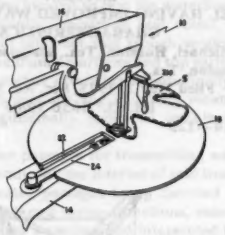
Int. Cl.² D05B 1/00

U.S. Cl. 112—262 **1 Claim**

1. A method of contour sewing material comprising the steps of:

repeatedly inserting a threaded stitching needle into the material at successive intervals to form a stitching pattern;

gripping and advancing the gripped material in increments, each increment of advancement occurring while the needle is inserted into the material and advances therewith from an initial position to a final position;



rotationally turning the gripped and advancing material in controlled increments simultaneously with said advancing of the material, each increment of turning and the simultaneously occurring increment of advancing occurring while the needle is inserted into the material and the material is gripped;

and each time after simultaneously advancing and turning the material, releasing the grip on the material, and withdrawing the stitching needle and returning the needle to said initial position.

3,965,833

SLIDE-FASTENER STRINGER WITH WARP-KNIT SUPPORT TAPES

Alfons Frohlich, and Marie-Luise Cappel, both of Essen, Germany, assignors to Opti-Holding AG, Glarus, Switzerland

Filed Oct. 3, 1974, Ser. No. 511,676

Claims priority, application Germany, Oct. 6, 1973, 2350318

Int. Cl.[3] D05B *97/10*

U.S. Cl. 112—265 **3 Claims**

1. A method of making a slide-fastener stringer tape comprising the steps of:

continuously forming a substantially nonstretchable knit warp of only smooth synthetic yarns;

continuously laying into said warp textured synthetic weft yarns and highly shrinkable smooth synthetic weft yarns; and

thereafter shrinking said highly shrinkable yarns transversely of the tape to form said textured yarns into a mass of bulges on at least one face of said tape within meshes formed by the smooth yarns.

3,965,834

PROCESS FOR THE PRODUCTION OF AEROSOL DISPENSING AND SIMILAR METAL CANS

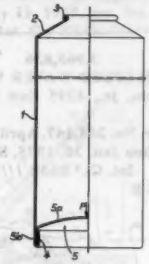
Gilbert Dolveck, St.-Barthelemy-de-Beaurepaire, France, assignor to Aluminium Suisse S.A., Switzerland

Filed Mar. 4, 1974, Ser. No. 448,054

Claims priority, application Switzerland, Mar. 8, 1973, 3380/73

Int. Cl.[3] B21D *51/00*

U.S. Cl. 113—120 Y **4 Claims**



1. A process for assemblying an aerosol dispensing or similar can comprising, providing a tubular wall portion open at one end and a bottom having a disked central bottom portion and a peripheral skirt, said bottom having a dimension for fitting inside said tubular wall portion with said skirt extending against the inner surface of said wall portion, press fitting the bottom through said open end with said skirt extending toward the open end and disposing it movable axially therein and the edge of said skirt axially spaced from the edge of the open end so that a marginal edge portion of the tubular wall portion at the open end thereof obtains, progressively folding the marginal edge portion of the tubular wall portion defining said open end inwardly while progressively displacing the skirt of said bottom axially inwardly of said tubular wall portion with a progressively developed lower fold on said marginal edge portion progressively advanced axially of the tubular wall portion with said edge of said skirt positively seated on the inner surface of the fold.

3,965,835

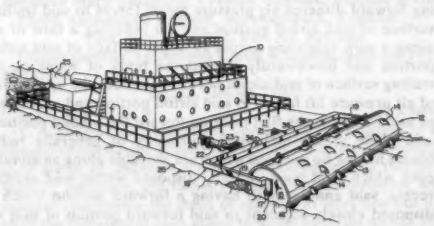
ARCTIC TRANSPORT AND MARINE OPERATION SYSTEM

John D. Bennett, Denton, Tex., assignor to Sun Oil Company, Dallas, Tex.

Filed Mar. 28, 1974, Ser. No. 455,820

Int. Cl.[3] B63B *35/12*

U.S. Cl. 114—42 **2 Claims**



1. A system for attachment to the front of a buoyant vessel for forming a channel to move the vessel through a sheet of ice, comprising:

a hollow buoyant drum extending transversely of the desired direction of channel formation and having a plurality of teeth projecting from the outer surface thereof;

a hollow framework mounting said buoyant drum for rotation about its longitudinal axis, said framework including openings along the inner periphery thereof;

a power source mounted within said drum; the exhaust heat from said power source being connected for discharge into the atmosphere through the framework openings to provide a warm air shroud in the region of said drum and inhibit refreezing of the ice pieces in the channel; and

means for coupling said power source to said drum to rotate the drum and the teeth into contact with the surface of an ice sheet and form a channel the width of the drum therethrough.

3,965,836

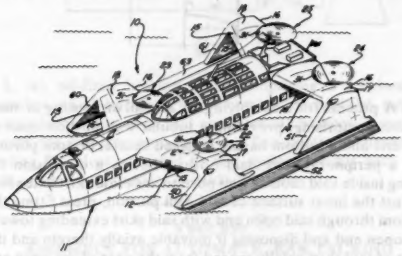
HIGH SPEED WATER VESSEL

Frank S. Malvestuto, Jr., 4295 East Mexico Ave., Denver, Colo. 80222

Continuation of Ser. No. 244,147, April 14, 1972, abandoned. This application Jan. 30, 1975, Ser. No. 545,493

Int. Cl.² B63B *1/18*

U.S. Cl. 114—66.5 R **6 Claims**



1. A boat comprising a hull having a surface for engaging a body of water to derive lift from the body of water during movement of said hull through the body of water, means for imparting additional lift forces to said hull to reduce water drag forces on said hull by raising said hull relative to the body of water from a first position in which a relatively large portion of said hull is submersed in the body of water to a second position in which a relatively small portion of said hull is submersed in the body of water, including an airfoil portion extending transversely relative to said hull at a location above said surface for producing a lift force upon movement through the air and propulsion means, said airfoil portion including an upper surface, a lower surface, and a trailing surface extending transversely to said upper and lower surfaces, said trailing surface being configured to define an arcuate recess having a forward portion and a pair of rearwardly extending side portions, said propulsion means including blade means disposed adjacent to a trailing surface of said airfoil portion for applying forward directed air pressure thrust forces to said trailing surface of said airfoil portion and for inducing a flow of air along a path extending across an upper surface of said airfoil portion and downwardly toward the body of water at the trailing surface of said airfoil portion to induce the application of air pressure lift forces to said airfoil portion and movement of said hull from the first position toward the second position, said blade means including a plurality of generally radial blades having tip portions which are movable along an annular path which is at least partially disposed within said arcuate recess, said annular path having a forward portion which is disposed closely adjacent to said forward portion of said recess and is disposed above said lower surface and below said upper surface, said annular path having a pair of spaced apart side portions which are disposed closely adjacent to said rearwardly extending side portions of said recess, each of said side portions of said annular path being disposed above said lower surface of said airfoil portion and below said upper surface of said airfoil portion, each of said blades including surface means for inducing the application of forwardly directed air pressure thrust forces against said trailing surface at said forward portion of said recess, the blade means being rotatable in a plane which is canted at an angle relative to the direction of movement of said vessel and which intersects the trailing surface of the airfoil portion, the blade means also being rotatable about an axis which is canted at angle relative to the forward direction of movement of said vessel.

3,965,837

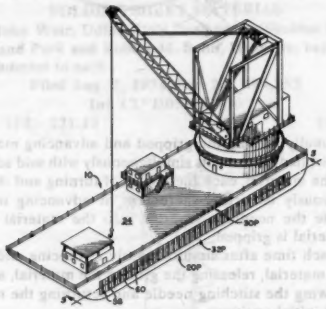
VESSEL HAVING IMPROVED WAVE RESPONSE CHARACTERISTICS

Farid Y. Michael, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed May 1, 1975, Ser. No. 573,531

Int. Cl.² B63B *39/03*

U.S. Cl. 114—125 **5 Claims**



1. A floatable vessel comprising:

a hull having top and bottom portions and port and starboard side portions,

said top portion including a working deck capable of carrying personnel and equipment;

each of said port and starboard side portions including vertically spaced upper and lower wing sections which form an outwardly open, inwardly closed trough section vertically therebetween,

each said trough section being bounded at the top by an outwardly directed undersurface of said upper wing section and at the bottom by an outwardly directed topsurface of said lower wing section;

each said trough section including a mouth extending between an outer end of said upper wing section and an outer end of said lower wing section to admit water into said trough section;

said topsurface of each said lower wing section being located for submersion during offshore operations to oppose upward motion of said vessel in heave and roll;

upper ballast tank means carried by said vessel and disposed to carry ballasting fluid above the center of said vessel;

means for

ballasting said upper tank means to raise the center of gravity and reduce the metacentric height of said vessel, and

deballasting said upper tank means to lower the center of gravity and increase the metacentric height of said vessel;

lower ballast tank means carried by said vessel and disposed to carry ballasting fluid below the center of said barge;

means for

ballasting said lower tank means to lower the center of gravity and increase the metacentric height of said vessel, and

deballasting said lower tank means to raise the center of gravity and reduce metacentric height of said vessel;

said trough sections and said upper ballast tanks, when ballasted, cooperating to provide mutually supplementary means operable to increase the natural roll period of said vessel in respone to

a reduction in effective water plane area of said vessel, created by said trough sections, and

a raising of the center of gravity of said vessel caused by ballasting of said upper ballast tanks;

said trough sections extending at least half the length of said vessel and being located so that the waterline of the body of water buoyantly supporting said vessel, in calm sea conditions, will intersect said trough sections vertically intermediate said undersurfaces and top surfaces thereof;

roll dampening means extending longitudinally along each of said trough sections and including means defining a series of longitudinally displaced openings, with said openings

providing water passages for transmitting water between said water body and the interior of said trough sections, with said water passages being directed in generally port and starboard facing directions, extending above and below said waterline and intersected thereby, and being continuously operable to admit water into said trough sections, or permit inmpeded movement of water outward of said trough sections substantially throughout the height of said trough sections, and dampen rolling motion of said vessel;

said undersurfaces of said upper wing sections of said trough sections being inclined upwardly and outwardly and being operable, by virtue of said inclination, to reduce wave force acting thereon; and

wave energy dissipating means comprising wall means, said wall means

alternating with said water passages, longitudinally of said vessel,

extending generally upright of said trough sections, and

being operable to dissipate wave energy imparted to port or starboard sides of said vessel.

3,965,838

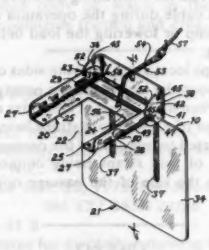
BACKWASH BAFFLE AND STABILIZING DEVICE FOR PROPELLER DRIVEN WATERCRAFT

Frank O. Uht, Bellevue, Wash., assignor to Jack Hughes, Bellevue, Wash., a part interest

Filed May 27, 1975, Ser. No. 581,160

Int. Cl.² B63H *25/48*

U.S. Cl. 114—145 A **13 Claims**



7. A backwash baffle and stabilizing device mountable to the anticavitation plate of a drive unit for operation below the operative water line of a watercraft, comprising:

a mounting member adapted to be anchored to the anticavitation plate;

a plate member pivotably mounted to the mounting member for movement about an axis between (a) a first position intersecting backwash produced by the drive unit and (b) a second position angularly displaced from the first position and in a plane parallel to the anticavitation plate;

releasable locking means mounted on one of the members directly interconnecting the members below the water line for operatively locking and unlocking the plate member relative to the mounting member in either of the positions thereof.

3,965,839

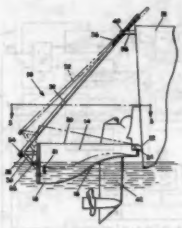
TROLLING BRAKE

George L. Lenz, Rte. No. 2, Cheboygan, Mich. 49721

Filed May 19, 1975, Ser. No. 578,627

Int. Cl.² B63H *25/44*

U.S. Cl. 114—145 A **13 Claims**



1. A trolling brake for controlling the speed of motor driven watercraft at idle speeds, said brake comprising:

an arcuate shield formed of a lightweight sheet material bent into a partial cylindrical shape from a pair of side portions to a rear central portion, said shield having a top edge and a bottom edge, said bottom edge sloping downwardly and rearwardly from the side portions to the rear central portion to provide a protective shield for downrigger lines and the like at the side portions thereof and to provide a water brake at a back portion thereof;

means for pivotably mounting said shield at the side portions thereof to the transom of a boat;

a rear support member for said shield, said support member being pivotably mounted at a lower end to a rear portion of said shield and having means at an upper end thereof to support said shield in a plurality of adjusted positions; and

means for adjustably mounting said upper portion of said support member on the transom of a boat.

3,965,840

METHODS AND APPARATUS FOR CONTROLLING THE PROPULSION OF AQUATIC VESSELS INCORPORATING SUCH APPARATUS

Jonathan Mark Blumberg, Creaton, England, assignor to Gec-Elliott Automation Limited, Borehamwood, England

Filed Nov. 18, 1974, Ser. No. 524,566

Claims priority, application United Kingdom, Nov. 21, 1973, 53937/73

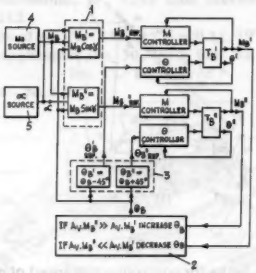
Int. Cl.² B63H *25/00*

U.S. Cl. 114—144 B **4 Claims**

1. A method of dynamically controlling the position of an aquatic vessel having at least two groups of steerable thrusters, each group of steerable thrusters including at least two individually steerable, individually variable-thrust thrusters, said method comprising the steps of steering at least one but not all of the thrusters of each group to direct its thrust on one side of a direction in which the net thrust vector of that group is to be directed, steering at least one other of the thrusters of each group to direct its thrust on the other side of said direction, maintaining two thrusters of a group at a constant angle with respect to each other, and controlling the thrust developed by each thruster of each group so that the net thrust

vector of said group is directed substantially in said direction, whereby in response to automatically measured variable input conditions the direction of the net thrust of at least one of said groups is automatically varied in a range of directions at a relatively high speed by changing the thrusts produced by individual thrusters of that group without further steering of such thrusters.

2. Apparatus for dynamically controlling the position of an aquatic vessel having at least two groups of steerable thrusters, each group of steerable thrusters including at least two individually steerable, individually variable-thrust thrusters, said apparatus comprising automatic control means for steering at



least one but not all of the thrusters of each said group to direct its thrust on one side of a direction in which the net thrust of that group is to be directed, means for steering at least one other of the thrusters of each said group to direct its thrust on the other side of said direction, means for controlling the thrust developed by each thruster of each said group so that the net thrust vector of said group is directed substantially in said direction, and means for automatically varying the direction of the net thrust vector of at least one of said groups at a relatively high speed by changing the thrusts produced by individual thrusters of that group and without further steering of such thrusters.

3,965,841

METHOD FOR HAULING A VESSEL ALONGSIDE A MOORING PLATFORM

Hendrik Magchiel Willem Croese, Schiedamseweg 103, Vlaardingen, Netherlands

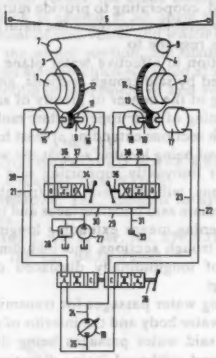
Filed Sept. 30, 1974, Ser. No. 510,729

Claims priority, application Netherlands, Apr. 26, 1974, 7405675

Int. Cl.² B63B *21/00*

U.S. Cl. 114—230 **11 Claims**

10. Apparatus for positioning a vessel alongside a mooring structure comprising a pair of winches each including a drum, cables extending from said drums for individual shortening and loosening, each of said winches including first rotary motor means for selectively driving said drum, each of said winches including second rotary motor means for exerting a like cable tensioning torque on said drum thereof independently of said first rotary motor means to normally apply a like tensioning force on each of said cables, said second motor means being a hydraulic motor, high and low pressure lines connected to both of said second motor means, and control means maintaining a constant pressure in each of said high and low pressure lines, said control means including means for connecting said second motor means high and low pressure lines directly to one another whereby when one of said winches is shortening its respective cables and the other of said winches is loosening its cable, said second motor means



coupled to said other winches is driven as a pump to drive said second motor means coupled to said one winch.

3,965,842

GRIPPING DEVICE FOR A SUSPENDED LOAD

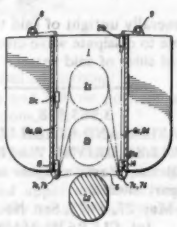
Jean Guy Cailloux, Six-Fours-la-Plage, France, assignor to Etat Francais, France

Filed Feb. 19, 1975, Ser. No. 551,024

Claims priority, application France, Mar. 5, 1974, 74.07350

Int. Cl.² B63B *21/56*

U.S. Cl. 114—235 R **12 Claims**



1. A gripping device for controlling the movements of a load suspended from a cable during the operation of bringing the load on board a ship or lowering the load below a ship, said device comprising:

at least two straps located on opposite sides of the cable and tensioned, above the load, across a passage in which the load moves when hoisted out of the water or placed in the water, one end of each of said straps being connected to means connected to one side of the passage and the other end of each of said straps being connected to means connected to the side of the passage opposite said one side thereof.

3,965,843

TRANSPORTING APPARATUS

Charles E. Smith, 7932 Eisenhower Blvd., Bridgeport, N.Y. 13030

Filed Dec. 19, 1974, Ser. No. 534,646

Int. Cl.² B63H *1/34, 16/00*

U.S. Cl. 115—19 **6 Claims**

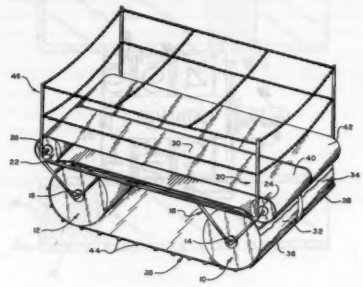
1. Buoyant apparatus for supporting a nominal load including a power source adapted to transmit motive power to said apparatus, thereby providing movement of said apparatus and load over a body of water, said apparatus comprising:

a. first and second pairs of cylinders having parallel, horizontal axes, at least said first pair being sufficiently buoyant to maintain said apparatus and the nominal load to be carried thereby submerged in water not further than approximately the diameter of said first pair of cylinders;

b. frame means maintaining said cylinders with the axe of said first pair in a first horizontal plane and the axes of said second pair in a second horizontal plane, above said first plane by a distance substantially equal to the combined radii of said first and second cylinders,

c. at least one continuous first belt of substantially the same width as said first pair of cylinders and encircling the same in such relation as to transmit rotation between said first belt and first pair of cylinders;

d. at least one continuous second belt of substantially the same width as said second pair of cylinders and encircling



the same in such relation as to transmit rotation between said second belt and second pair of cylinders;

e. said frame means maintaining said cylinders in such relation that a significant portion of the unwardly facing, outer surface of said first belt is in contact with substantially the entire downwardly facing, outer surface of said second belt for transmission of rotation between said belts, the upwardly facing, outer surface of said second belt being disposed for support of the power source providing motion thereto;

f. whereby, when supporting said nominal load, substantially all parts of said apparatus in contact with said body of water are adapted to move in a direction imparting said movement of said apparatus and load over said body of water in the desired direction by providing propulsion through said body of water in the desired direction thereby minimizing friction and drag.

3,965,844

APPARATUS FOR PIVOTALLY MOUNTING A FISHING MOTOR

John O. Brock; Marmion Dean Davis, and James Robert Wray, all of Shelby, N.C., assignors to Interstate Industries, Inc., Shelby, N.C.

Filed Mar. 27, 1975, Ser. No. 562,598
Int. Cl.² B63H 21/26
U.S. Cl. 115—41 R **12 Claims**

1. An apparatus for pivotally mounting an outboard motor on a fishing boat or the like and such that the motor may be selectively and remotely pivoted between a vertically disposed lowered position wherein the motor is operatively held in the water and a horizontally disposed raised position wherein the motor is removed from the water, said apparatus comprising

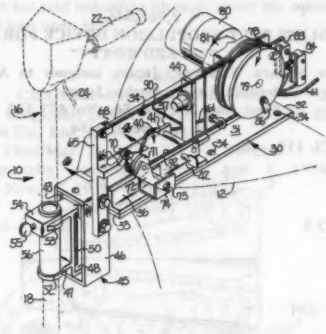
a mounting frame adapted to be fixedly attached to a boat,

a drive wheel rotatably carried by said mounting frame,

means for selectively rotating said drive wheel in either direction, and including a reversible electric motor carried by said frame and a manually operable switch for operating said electric motor in either direction,

a bracket pivotally carried by said mounting frame for pivotal movement in a vertical plane about a fixed horizontal axis and between a forward position and a retracted position,

means carried by said bracket for supportingly attaching the shaft of an outboard motor thereto and such that the outboard motor is disposed in its lowered position when said bracket is in its forward position and the outboard motor is disposed in its raised position when said bracket is in its retracted position,



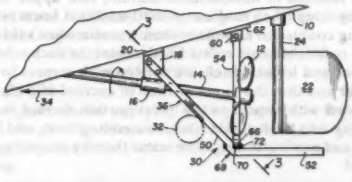
cable means operatively interconnecting said drive wheel and bracket and including a first cable segment extending from said bracket in a first rotational direction with respect to said horizontal axis, and a second cable segment extending from said bracket in the opposite rotational direction with respect to said horizontal axis, whereby said bracket may be pivoted from said forward position to said retracted position upon rotation of said drive wheel in a first direction and the bracket may be reversely pivoted upon rotation of said drive wheel in the opposite direction.

3,965,845

BOAT PROPELLER PROTECTIVE STRUCTURE

Michael T. Lubov, 8 Broadway, Lawrence, N.Y. 11559

Filed Nov. 26, 1975, Ser. No. 635,625
Int. Cl.² B63H 5/16
U.S. Cl. 115—42 **6 Claims**



1. A protective structure for the propeller of a boat of the type wherein said propeller operates beneath the stern of said boat and is powered in rotation by a propeller shaft journalled in a depending shaft strut, said protective structure comprising a three-sectioned debris-blocking member including a U-shaped attaching section connected to said depending shaft strut, an oblique blocking section extending from said U-shaped section having an operative position located in the vertical plane of said propeller shaft and forwardly of said propeller, and a substantially horizontally oriented blocking section extending from said oblique blocking section having an operative position located also in the vertical plane of said propeller shaft and beneath said propeller, the juncture of said

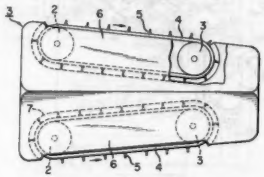
oblique and said horizontally oriented blocking sections being located substantially in the operating plane of said propeller, and a U-shaped holding member connected at its free ends to extend in depending relation from said boat and in surrounding relation about said propeller, said depending end of said U-shaped holding member being connected to said oblique and horizontally oriented sections at said juncture therebetween, whereby contact of said propeller with any debris is minimized by said protective structure by virtue of its surrounding position about said propeller.

3,965,846

ENDLESS BELT PROPULSION DEVICE FOR A HIGH SPEED BOAT

Osamu Mihara, Fujisawa, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 7, 1974, Ser. No. 477,422
Int. Cl.² B63H *1/34*
U.S. Cl. 115—64 **4 Claims**



1. A high-speed boat having at least one propeller unit for driving said boat and said propeller unit comprising:

a. a housing;

b. a plurality of wheel means arranged in spaces within said housing, each said wheel means comprising an upper and lower wheel;

c. at least two endless belt means arranged around said wheel means, each said belt means being in contact with the upper and lower wheel and each said belt means including a plurality of blades extending therefrom such that a portion of said plurality of blades extend outside of said housing wherein the angle of said blades relative to said housing is variable;

d. drive means for rotating at least two of said wheel means, said drive means comprising an inner shaft, an outer shaft and means for rotating said inner and outer shafts, said inner and outer shafts being interconnected by an oblique key inserted in oblique slots therein, said upper wheels being coupled to said outer shaft and said lower wheels being coupled to said inner shaft wherein when said inner and outer shafts are rotated with respect to each other the upper and lower wheels are rotated with respect to each other and thus the upper portion of each of said blades is twisted with respect to the lower portion thereof thereby tilting said blades, said blades extending from said housing and moving through the water thereby propelling said boat.

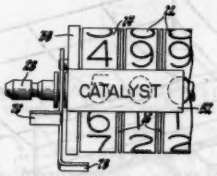
3,965,847

SERVICE MINDER ODOMETER

Kenneth R. Deming, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1975, Ser. No. 564,712
Int. Cl.² G01C *22/00*; G01D *13/00*
U.S. Cl. 116—114 W **3 Claims**

1. In an odometer assembly of the type having multiple counting wheels rotatable upon a shaft in response to mileage intervals, service indicating means responsive to a predetermined rotation of one of the counting wheels to move a signal into a visible position, a rotatable indicating member mounted on said shaft adjacent said one counting wheel, a flag portion of said indicating member extending in overlying relation to said counting wheels, wiper spring means between said indicating member and said one counting wheel to produce rotative movement of the indicating member from a first operative position to a second operative position in which said flag portion is visible to an observer, said wiper spring means being integrally attached to said member at one end and extending in a radial and axial direction toward said one counting wheel, circumferentially spaced detent means in said one counting wheel engaged by a second end of said wiper spring means to interconnect said member and said one counting wheel for rotation together during movement between first and second



operative positions, a stop washer mounted adjacent said indicating member having means operably engageable with said indicating member limiting rotation of said indicating member between said first and second operative positions whereby movement of said one counting wheel after rotation of said indicating member into its second operational position is permitted by flexing of said wiper spring means and resultant disengagement between its second end and said circumferentially spaced detent means, manually operated reset means including a lever for counter-rotating said stop washer and connected service indicating member in a direction corresponding to movement from the second operative position back to the first operative position.

3,965,848

FEVER INDICATOR

Robert Shotkin, Millburn, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Continuation-in-part of Ser. No. 409,819, Oct. 26, 1973. This application Jan. 31, 1975, Ser. No. 545,992
Int. Cl.² G01K *11/06*
U.S. Cl. 116—114.5 **2 Claims**

1. A fever indicator for determining temperatures above a predetermined value comprising:

a vessel having walls, a closed end, and an open end;

a plug member disposed for movement within said vessel;

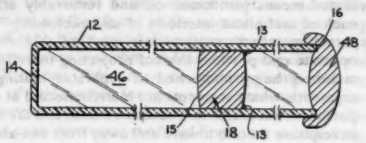
means bonding said plug within said vessel at a first position spaced apart from said vessel closed end in airtight relationship with said vessel walls, said bonding means comprising a material meltable at or above said predetermined temperature;

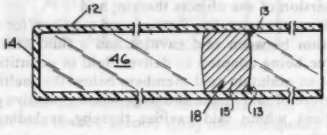
a portion of said vessel between said closed end and plug, said portion being evacuated of air;

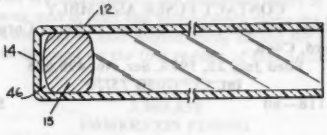
a removable closure over said vessel sealing said open end;

and,

a second portion of said vessel extending between said plug







and said open end, said vessel second portion being evacuated of air.

3,965,849

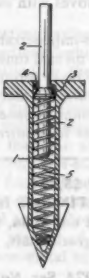
COILED EDGE GUIDE FOR ROD-TUBE SIGNAL DEVICE AND METHOD

Glen R. Gee, Selma, Calif., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 17, 1975, Ser. No. 559,166

Int. Cl.² B29C *17/02*; G01K *11/06*

U.S. Cl. 116—114.5 **7 Claims**



1. A signalling device for indicating the attainment or surpassing of a critical condition comprising:

1. an elongate hollow element having at least one open end,

2. an indicating element within the hollow of the elongate hollow element and having sufficient clearance between the indicating element and the interior walls of the elongate hollow element to be capable of allowing the indicating element to freely slide within the hollow,

3. means for providing a force capable of extending the indicating element out of the at least one open end so as to provide a visual signal, and

4. means for providing a restraint on the indicating element so that it will not extend out of the at least one open end so as to provide a visual signal until a predetermined condition has been attained or surpassed,

said signalling device being characterized by said at least one open end having about the opening an edge lip, said edge lip being both (1) a restraining means for said indicating element in an extended position and (2) a flexible polymeric resin material having a reverse spiral coil curl that provides a guiding element for said indicating element about the opening at the at least one open end.

3,965,850

CHANNEL INDICATOR DEVICE

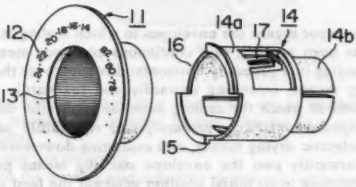
Siro Tada, Chigasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 24, 1975, Ser. No. 561,355

Claims priority, application Japan, Apr. 1, 1974, 49-37665[U]; Nov. 20, 1974, 49-141015[U]

Int. Cl.² H03J *1/02*

U.S. Cl. 116—124.2 R **5 Claims**



1. A channel indicator device comprising a first indicator shaft linked to a channel knob for rotation therewith, a second indicator tubular shaft having a plurality of resilient members each having a knurl formed thereon, said second indicator tubular shaft being mounted on said first indicator shaft, and an indication digit plate having a knurl adapted to gear with said knurls on said resilient members formed thereon and having channel digits arranged thereon.

3,965,851

APPARATUS FOR APPLYING SEALING MATERIAL TO ENVELOPES

Robert Cohn, Millbrae, Calif., assignor to Champion International Corporation, Stamford, Conn.

Filed July 19, 1974, Ser. No. 490,203

Int. Cl.² B05C *1/02*, *13/02*

U.S. Cl. 118—1 **23 Claims**

1. Apparatus for applying sealing material to the flap closures of a plurality of envelopes, each including a body portion having a folded edge portion opposite said flap closure, comprising:

an endless, continuous conveyor means conveying a succession of envelopes in linear array, said conveyor means gripping each envelope along the folded edge thereof, with the flap closure being disposed below the plane of the envelope;

feed mechanism means in adjacent relation to said conveyor means, and which sequentially feeds the envelopes for engagement by said conveyor means;

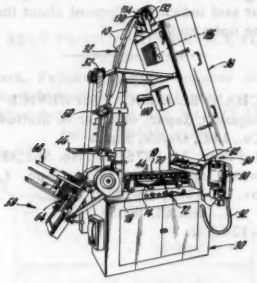
folding means in adjacent relation to said conveyor means whereover said conveyor means carries along said envelopes, and which is adapted to unfold the flap closure of each envelope to a generally horizontal position;

sealing material applicator means in adjacent relation to said conveyor means whereover said conveyor means

carries along said envelopes, and which is adapted to apply sealing material to one or more surfaces of the envelope;

dielectric dryer means in adjacent relationship to said conveyor means whereover said conveyor means carried along said envelopes, and which is provided to dry the sealing material applied to the envelopes; and

envelope stacking means in adjacent relation to said conveyor means whereto said conveyor means carried along said envelopes, and which is adapted to remove from said



conveyor means the envelopes to which sealing material has been applied, said continuous conveyor means extending in a generally horizontal direction over the folding means, extending upwardly and rearwardly at the point at which the sealing material applicator means is disposed, extending upwardly and rearwardly past the dielectric drying means, and extending downwardly and rearwardly past the envelope stacking means prior to returning to its initial position adjacent the feed mechanism means.

3,965,852

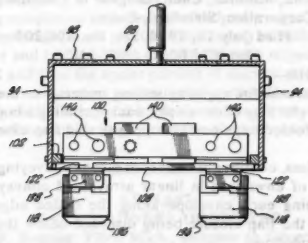
COATING APPARATUS

Donald F. Hardy, Horseheads, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.

Division of Ser. No. 374,298, June 28, 1973, Pat. No. 3,886,891, which is a continuation-in-part of Ser. Nos. 232,455, March 7, 1972, Pat. No. 3,856,498, and Ser. No. 732,413, March 7, 1972, Pat. No. 3,571,920. This application Jan. 6, 1975, Ser. No. 538,702

Int. Cl.² B05C *11/12*

U.S. Cl. 118—8 **8 Claims**



1. A fluidized bed dipping mechanism adapted to simultaneously transfer a plurality of heated objects to and through the media retained in said bed and including:

means supporting said fluidized bed and having and overhead frame between respective points where said objects are grasped, dipped into said bed and subsequently released said frame including an enclosure the bottom wall of which is comprised of a plurality of abutted mounting plates, each thereof having a multiplicity of parallelly arranged elongated guide slots therein;

actuator means positioned on and removably affixed to each of said plates interiorly of said enclosure;

separate members positioned in each of said slots with opposite end portions thereof projecting therefrom, said members being comprised of separable mating clamp segments, which segments are interconnected at one end portion of each with said actuator means and are movable in response thereto toward and away from one another in said slots;

said separate clamping members further including in their other end portions cavities shaped to grasp and wholly surround a segment of said objects thus shielding such segment from exposure to the fluidized bed media during immersion of the objects therein; and

conduit means extending through said members for communication between said cavities and a fluid source, said source being adapted to deliver fluid in quantities sufficient to maintain said members below the melting temperature of said media and to generate a positive pressure gradient within said cavities thereby excluding media therefrom.

3,965,853

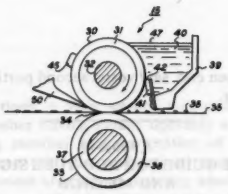
CONTACT FUSER ASSEMBLY

Rabin Moser, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 22, 1974, Ser. No. 490,635

Int. Cl.² G03G *15/20*

U.S. Cl. 118—60 **5 Claims**



1. Contact fuser apparatus for fixing toner images to a support member, said apparatus comprising:

a heated fuser roll structure having a rigid, thermally conductive core;

a backup roll forming a nip with said core through which said support member moves with said toner images contacting said core; and

means for forming a toner-impenetrable layer on said rigid core and a release layer on said toner impenetrable layer, said toner-impenetrable layer forming means comprising polyethylene which chemically reacts with the surface of said rigid core, said toner-impenetrable layer forming means containing copper for controlling said reactivity.

3,965,854

APPARATUS FOR COATING OF HOLLOW BODIES

Werner Scheiber, Frankfurt am Main, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 3, 1974, Ser. No. 476,031

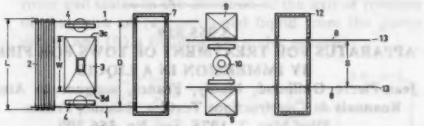
Claims priority, application Germany, June 4, 1973, 2328403; May 21, 1974, 2424558

Int. Cl.² B05C *5/00*, *11/14*

U.S. Cl. 118—66 **10 Claims**

1. An apparatus for coating rotationally symmetrical elongated bodies comprising at least two in-line successive conveyors defining a transport path for said bodies, each of said conveyors comprising a pair of transversely spaced horizontally extending conveyor chains, the conveyor chains of a first

of said conveyors engaging said bodies at first regions of the length of the bodies axially spaced from second regions of engagement by the chains of the second conveyor along the length of each body, said bodies lying athwart said conveyors; first spray means including at least one spray chamber along the path of said first conveyor enclosing only said second regions of said bodies for spraying a hardenable protective layer thereon over only the second regions of said bodies; at least one oven downstream of said first spray means along said



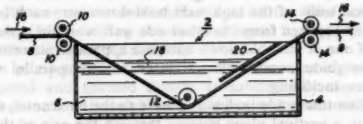
transport path for hardening the layers upon said second regions of said bodies; second spray means disposed along the path of said second conveyor and enclosing said first regions of said bodies and spraying respective layers thereon upon said first regions and upon limited lengths of said bodies while said bodies are supported on the hardened layers of said second regions; and at least one second oven along the transport path downstream of said second spray means for hardening the layers disposed on the first regions of said bodies.

3,965,855

IMMERSION FUSING

Ernest A. Weiler, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 4, 1975, Ser. No. 565,303
Int. Cl.² G03G *15/20*
U.S. Cl. 118—68 **2 Claims**



1. A fusing apparatus for fixing a xerographic image of thermo-responsive powder located on a support member comprising:

a heat exchange portion having a heat storage and transfer medium, said medium including a heated liquid metal which is non-wetting to the support member and the image, and a molten non-metal floating atop said liquid metal, said liquid metal heated to a temperature greater than the fusing temperature of the thermo-responsive powder and less than the scorch point of the support member said molten non-metal acting as a vapor and oxidation barrier for the liquid metal,

container means for containing said liquid metal and said molten non-metal and including a baffle extending to a depth below the surface of said metal and above the surface of said non-metal to contain said floating non-metal,

conveying means for conveying the support member with the xerographic powder image thereon through said molten non-metal and into said heat exchange portion, whereby said support member is coated by said molten non-metal prior to its entry into said liquid metal and said xerographic powder image is fixed by heat transfer, from said heat storage and transfer medium to the support member and the powder image, and

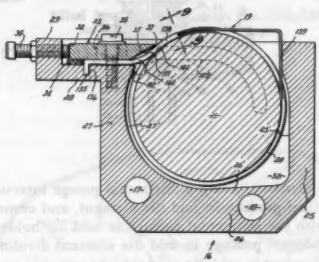
conveying means further conveying the support member from said heat exchange portion in the area thereof not covered by said non-metal, whereby said molten non-metal is wrung by said liquid metal to a thin coating on said support member.

3,965,856

ADHESIVE WHEEL APPLICATOR DEVICE

Charles H. Scholl, Vermilion, and Alan B. Reighard, Bay Village, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Dec. 27, 1974, Ser. No. 536,730
Int. Cl.² B05C *1/02*
U.S. Cl. 118—202 **17 Claims**



1. An adhesive applicator device for use in combination with a machine for applying molten adhesive to a substrate comprising

an open top reservoir,

means for heating said reservoir to maintain adhesive contained therein in a molten state,

a wheel mounted for rotation within said reservoir, said wheel having a plurality of annular grooves in the periphery thereof,

a doctor blade adjustably mounted upon said reservoir, said doctor blade being operative to control the thickness of a film of adhesive applied by said wheel to a substrate as the substrate is passed over the wheel,

a plurality of stripper fingers mounted upon said reservoir and extending over the top of said applicator wheel, each of said stripper fingers having a section thereof located within one of said plurality of annular grooves of said applicator wheel, said sections of said stripper fingers which are located within said grooves of said applicator wheel extending between said doctor blade and said applicator wheel, and

a resilient tube surrounding each of said stripper fingers at least at the point at which said stripper fingers extend between said doctor blade and said wheel, said resilient tubes being operative to form a dynamic seal between the doctor blade and the annular grooves of said applicator wheel so as to preclude accumulation of molten adhesive about said stripper fingers at the top of said applicator wheel.

3,965,857

APPARATUS FOR PRODUCING A UNIFORM METALLIC COATING ON WIRE

Lawson J. Baxter, Raytown, Mo., assignor to Armco Steel Corporation, Middletown, Ohio

Continuation of Ser. No. 462,307, April 19, 1974, abandoned, which is a continuation of Ser. No. 40,791, May 27, 1970, abandoned, which is a division of Ser. No. 695,097, Jan. 2, 1968, Pat. No. 3,523,815. This application June 12, 1975, Ser. No. 586,421
Int. Cl.² B05C *3/12*
U.S. Cl. 118—405 **3 Claims**

1. In an apparatus for applying a molten coating metal to a

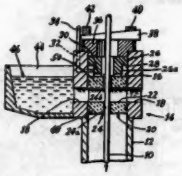
wire, which includes a reservoir for said molten coating metal having a vertical passage therethrough,

a. a die holder, having a vertical passage therethrough, disposed in said vertical passage through said reservoir,

b. a substantially horizontal passage intersecting said passage in said die holder, and communicating with said reservoir,

c. a one-piece die element disposed in said die holder,

d. said die element having a vertical passage therethrough, defining a path of travel for said wire,



e. said die element having a horizontal passge intersecting said vertical passage in said die element, and communicating with the horizontal passage in said die holder,

f. said horizontal passage in said die element dividing the vertical passage in said die element into entrance and exit portions and being larger in diameter than said vertical passage,

g. said exit portion having a clearance over said wire of from about 0.010 to about 0.040 inch on the diameter, and

h. means for centering said wire with respect to said exit die.

3,965,858

APPARATUS FOR APPLYING PLASTIC COATINGS TO SMALL BODIES

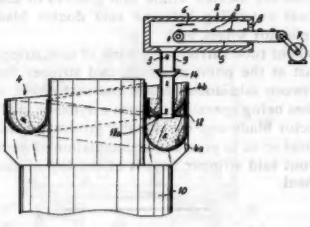
Jacques Antoine Burdin, Ecully (Rhone), France, assignor to Societe Anonyme dite ATO CHIMIE, Courbevoie, France

Division of Ser. No. 381,439, July 23, 1973. This application Aug. 12, 1974, Ser. No. 496,586

Claims priority, application France, July 26, 1972, 72.27618; May 30, 1973, 73.20470

Int. Cl.² B05C *3/08*

U.S. Cl. 118—417 **10 Claims**



1. An apparatus for coating mobile workpieces with plastic material, comprising:

a vessel of substantially rectangular cross-section having a flat bottom for confining a fluidized bed of plastic material, said vessel forming a track for said material extending between a loading point and an unloading point, said bottom forming a channel for the circulation of a cooling fluid;

vibrating means coupled with said vessel for propelling said material along said track from said loading point to said unloading point;

heating means adjacent said vessel;

feed means for delivering workpieces via said heating means to said vessel at an elevated temperature at which particles of said plastic material fuse onto the surfaces of said workpieces to form a film, said feed means terminating above said loading point whereby the heated workpieces are dropped onto said track for entrainment by said plastic material to said unloading point; and

separating means at said unloading point for removing nonadhering particles from the coated workpieces.

3,965,859

APPARATUS FOR TREATMENT OF TOWS FOR FIBERS BY IMMERSION IN A LIQUID

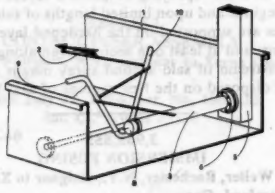
Jean-Pierre Guilbaud, Mably, France, assignor to Ateliers Roannais de Constructions Textiles, Roanne, France

Filed Mar. 7, 1975, Ser. No. 556,390

Claims priority, application France, Mar. 8, 1974, 74.08097

Int. Cl.² B05C *3/12*

U.S. Cl. 118—428 **5 Claims**



1. An apparatus for the treatment of a tow for fibers which is at least partially immersed in a liquid treatment bath, comprising a tank having substantially vertical walls for containing a liquid treatment bath and which includes hold-down bars mounted, so as to overhang into the tank and over one of the vertical walls of the tank, said hold-down bars each having a free end spaced from the other side wall, wherein in the vicinity of one of the hold-down bars, the apparatus also comprises a tow-guide combination situated in two parallel vertical planes, including:

a first tow-guide inclined relative to the horizontal, situated in a vertical plane passing through the axis of the hold-down bar and fixed to the free end of the hold-down bar so that it is flush with the lower generatrix of the hold-down bar, and

a second tow-guide, situated downstream from the first tow-guide relative to the direction of forward movement of the tow, and fixed, at the same level as the first, to the vertical wall of the tank opposite the wall on which the hold-down bar is mounted so that it overhangs into the tank after its point of attachment to the wall, the second tow-guide comprising a horizontal part followed by a part which is inclined relative to the vertical and the slope of which is opposite to the incline of the first tow-guide, each tow guide having a free end spaced from one side wall.

3,965,860

PLYWOOD MANUFACTURE USING FOAMED GLUES

Charles N. Cone, Portland, and Julius M. Steinberg, Hillsboro, both of Oreg., assignors to Pacific Adhesives, Inc., Hillsboro, Oreg.

Division of Ser. No. 80,961, Oct. 15, 1970, abandoned, Continuation-in-part of Ser. No. 839,481, July 7, 1969, abandoned. This application Mar. 23, 1973, Ser. No. 344,200

Int. Cl.² B05C *11/10*; B32B *5/18*

U.S. Cl. 118—612 **11 Claims**

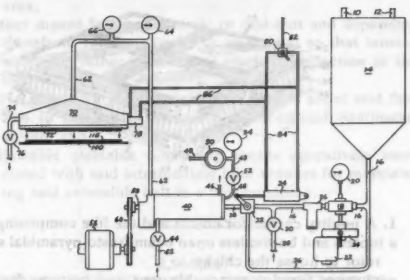
1. Apparatus for applying foamed liquids to surface, which comprises:

a. positive displacement liquid pump means for continously propelling the liquid in unfoamed condition at a predetermined flow rate,

b. liquid foaming means communicating with the pump means for receiving the propelled liquid and foaming it as it is propelled, the foaming means comprising:

1. a generally cylindrical rotor and stator, with the rotor being rotatably mounted within the stator and spaced therefrom,

2. at one end of the stator first and second conduit means arranged for the respective introduction between the rotor and stator in the direction of the axis of rotation of the rotor of (a) unfoamed liquid from the pump means and (b) a foaming gas under pressure,



3. a plurality of radially extending spaced recesses in the opposed cylindrical surfaces of the rotor and stator, the recesses in the rotor being arranged to sweep across the recesses in the stator upon rotation of the rotor, thereby agitating the liquid and gas and foaming the liquid, and

4. third conduit means at the end of the stator opposite said one end for conveying away the resultant foamed liquid, and

c. applicator means communicating with the third conduit means for receiving the foamed liquid and applying it continuously to the surface,

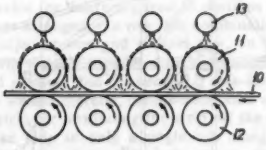
d. the pump means maintaining the flow rates of the unfoamed and foamed liquids at substantially the same values on a unit weight of liquid per unit time basis.

3,965,861

SEPARATED ROLLER LIQUID DEVELOPMENT

Osamu Fukushima; Seiji Matsumoto, and Masamichi Sato, all of Asaka, Japan, assignors to Rank Xerox Ltd., London, England

Filed Sept. 4, 1974, Ser. No. 503,200
Int. Cl.² G03G *13/10*
U.S. Cl. 118—637 **4 Claims**



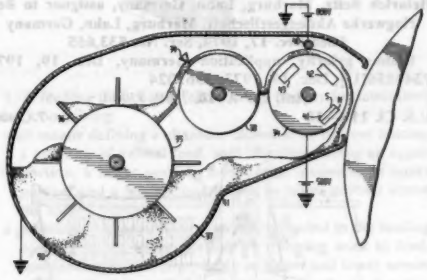
1. An apparatus for the development of electrostatographic latent images comprising at least one pair of rollers spaced in close proximity to one another capable of having a latent image bearing substrate interposed therebetween, means for furnishing liquid developer to the surface of one roller which functions as the developing roller and is adjacent the latent image when said substrate is present, a development electrode means having one surface concentric with and spaced in close proximity to the developing roller which, in cooperation with the developing roller within the range of about 0.2 to about 2 mm apart, forms a conduit for transporting the liquid developer in laminar flow having a Reynolds number below about 2000 to a latent image bearing substrate when interposed between said rollers.

3,965,862

XEROGRAPHIC DEVELOPMENT SYSTEM

Frank Yank, Hacienda Heights, Calif., and Jerome E. Lamel, Plano, Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 30, 1975, Ser. No. 545,560
Int. Cl.² G03G *15/09*
U.S. Cl. 118—637 **5 Claims**



1. An apparatus for developing a latent image on a charged photoconductive surface wherein the potential in the area of the image is higher than that of the remainder of the said surface comprising

a sump containing developer material comprising toner particles triboelectrically attracted to magnetic carrier granules,

a rotatable magnetic applicator means disposed in the sump for applying toner particles to the photoconductive surface, said applicator means being electrically biased at a potential intermediate the potential in the area of the image and remaining areas of the said surface, and

a stationary bar disposed in spaced substantially parallel relationship with the surface of said magnetic applicator means and extending throughout the length thereof, said bar being electrically biased to a potential greater than that on the applicator means but less than the potential of the latent image on the said photoconductive surface and said bar is disposed upstream of the photoconductive surface in the rotating path of the applicator means.

3,965,863

CHEMICAL LITTER UNIT

Harry M. Scott, 6472-A Warner Ave., Huntington Beach, Calif. 92647

Filed Apr. 7, 1975, Ser. No. 565,956
Int. Cl.² A01K *29/00*
U.S. Cl. 119—1 **8 Claims**

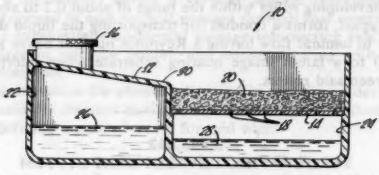
1. A chemical litter unit for a household pet comprising:

a holding tank;

a receptacle area attached adjacent said holding tank;

a litter tray mounted above said receptacle area, said tray having a series of perforations; and

a plurality of nonabsorbent chips located in said tray, said receptacle area containing a chemical solution for receipt



of liquid excreta from said pet, said holding tank for receipt of solid excreta of said pet.

3,965,864

AUTOMATIC DEVICE FOR THE MAINTENANCE OF SMALL ANIMALS

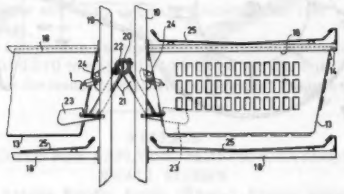
Heinrich Beltz, Marburg, Lahn, Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Lahn, Germany

Filed Dec. 17, 1974, Ser. No. 533,655

Claims priority, application Germany, Dec. 19, 1973, 7344856[U]; Dec. 19, 1973, 2363024

Int. Cl.² A01K *1/00*, *7/00*

U.S. Cl. 119—18 **7 Claims**



1. An automatic device for rational management of small animals comprising, a frame, at least one pair of separate apertured cages for retaining small animals removably mounted on said frame in adjacent spaced locations, means for supplying drinking water to said cages; means for supplying fodder to said cages including a common fodder supply conveyor mounted in said frame between said cages and having a pair of feed tubes extending therefrom, said feed tubes each including a feeding bowl mounted on the end thereof remote from said conveyor and extending into its associated cage through an aperture in a side wall thereof; and means mounted in said frame for receiving and automatically removing dung falling from said cages; each of said feed bowls having a bottom, side, and top wall and wherein the top wall has an opening therein through which the animals feed, said feed tube being connected to and in communication with the feed bowl through the top wall thereof whereby fodder supplied to said bowl through the tubes rises only to the level of the top wall; the bottom wall of the bowl having thin slots formed therein to allow only fodder fines to pass therethrough; and said water supply means including a water supply valve having an inlet port and an outlet spout formed; and a valve seat formed therein between said inlet port and outlet spout; a valve closure element mounted in said valve upstream from said seat; spring means for biasing said closure element against said seat to normally close said spout; a control pin secured in said closure element and extending through and beyond said spout to a point where it is exposed for actuation by an animal such that angular movement thereof tilts the closure member and opens the valve; said valve having a by-pass passage formed therein providing communication between said inlet port and said spout around said closure member, and an adjusting screw threadably mounted in the valve with an end thereof extending into said passageway for selectively opening and closing the passageway and controlling the flow of water therethrough whereby a small continuous supply of water can pass through said spout when the valve is closed by said closure member.

3,965,865

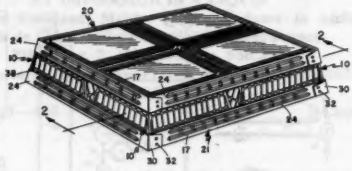
POULTRY CARRIER INCORPORATING DISPOSABLE FEED TRAYS

Peter Kundikoff, Rte. 4, Box 870, Escondido, Calif.

Filed June 5, 1975, Ser. No. 583,998

Int. Cl.² A01K *31/18*; B65D *11/00*

U.S. Cl. 119—19 **8 Claims**



1. A poultry carrier for chicks and the like comprising:

a topless and bottomless open beam frusto-pyramidal separator to house the chicks,

enclosures forming removable tops and bottoms for said separators,

means connected to said enclosures to permit vertical stacking of the enclosed separators for transport including,

mating male and female parts in a bottom enclosure of a first separator and a top enclosure of a subtending separator,

said male and female parts dividing the top and bottom enclosures into quadrants,

adjacent bottom edges of said separators being commonly received in a side by side relationship in an interior groove formed by a male part,

grooves running adjacent the edges of said enclosures to accommodate the exterior facing edges of said separators,

the top edges of said separators being received in grooves formed by the male parts of said top enclosure.

3,965,866

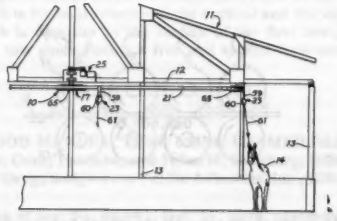
ANIMAL EXERCISER

Merle J. Lorentz, Rte. 1, Chewelah, Wash. 99109, and Donald F. Salzman, Rte. 3 - Box 167B, Colville, Wash. 99114

Filed Feb. 7, 1975, Ser. No. 548.084

Int. Cl.² A01K *29/00*

U.S. Cl. 119—29 **4 Claims**



1. An animal exercising device adapted to be mounted to an overhead structure spanning a prescribed open area and having peripheral support, such as ceiling joists and outside walls of a building structure, comprising:

a drive sheave adapted to be mounted to the overhead structure within the prescribed open area for rotation about a first vertical axis;

an end idler sheave adapted to be mounted to the overhead structure for rotation about a vertical axis spaced from the drive sheave;

a plurality of intermediate idler sheaves also adapted to be mounted to the overhead structure within the prescribed open area for rotation about vertical axes spaced from one another and between the axes of said drive sheave and said end idler sheave;

an extensible endless belt extending about said drive sheave, said end idler sheave and said intermediate idler sheaves to define a continuous circuit within the prescribed open area;

tether means fastened directly to said belt and depending therefrom for attachment to an animal so that tension along the tether means may result in deflection of the belt;

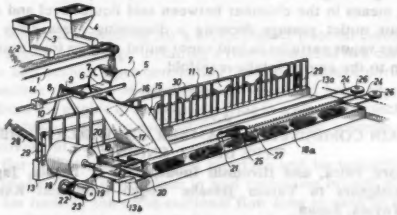
drive means for rotating said drive sheave about said first axis to thereby move said belt about said continuous circuit; and

adjustable yieldable tensioning means operatively associated with said intermediate idler sheaves for maintaining said extensible belt in a taut condition.

3,965,867
DEVICE FOR DELIVERING FEED PORTIONS TO DIFFERENT PLACES

Carl Anders Olsson, Eskilstuna, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Oct. 7, 1974, Ser. No. 512,601
Int. Cl.² A01K *5/02*
U.S. Cl. 119—52 AF **3 Claims**

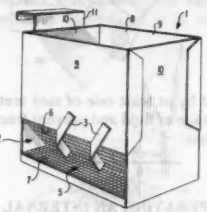


1. In a device for delivering feed in portions to a plurality of feed places arranged in a row, the combination of a rotatable shaft adjacent one end of said row, an underlayer, a conveyor strip slidably supported on the underlayer when in an extended position and connected at one end to the shaft and initially wound thereon, means associated with the other end of the strip for unwinding the strip off the shaft and for extending the strip in only a single run along said row as unwinding the strip from the shaft occurs, the strip when extended along said row having said other end of the strip adjacent the other end of the row and at substantially the same level as said one end of the strip, and feed portioning means adjacent said one end of said row operable to deliver feed portions of predetermined weight successively upon the conveyor strip as the same is extended whereby the feed portions are moved to the respective feed places by said extending of the strip.

3,965,868
LABORATORY MOUSE FEEDER

John Hunziker, Jr., Pine Bluff, Ark., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Continuation-in-part of Ser. No. 464,489, April 25, 1974, Pat. No. 3,902,459. This application Apr. 14, 1975, Ser. No. 567,718
Int. Cl.² A01K *5/00*
U.S. Cl. 119—52 R **7 Claims**



1. A feeding device and feed storage hopper for laboratory mice, comprising:

wall means defining a chamber closed at its bottom holding a quantity of animal feed, said chamber having an upper portion, a lower portion, a feed inlet means at its upper portion and a feeding opening in its lower portion above the closed bottom;

a generally V-shaped feeding means mounted in the feeding opening in the lower portion for allowing mice to feed, said feeding means comprising an upper and lower screen which project inwardly toward the center of said chamber and meet in the apex of the V, said upper screen being affixed in said feed opening at an inclined angle sufficient so that the weight of the feed thereabove forces a continual collapsing downwardly of the feed as it is comsumed from below, said lower screen being horizontally affixed in said opening below said upper screen and above said closed bottom, wherein a mouse can ingest the feed resting on said upper screen, said upper and lower screen having a mesh size sufficient to support powdered mash feed without going through its openings while allowing a mouse to feed therethrough; and

partition means connected to said feeding means for preventing the mice from entering said feeder means thereby precluding contamination of the feed through feces or urine.

3,965,869
ASYMMETRICAL DIVIDER BLOCK FOR A ROTARY DISPLACEMENT ENGINE

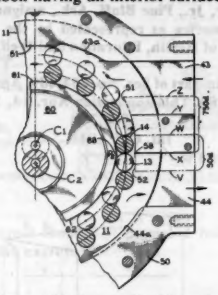
Lloyd Edward Miller, Jr., 389 Granello Ave., Coral Gables, Fla. 33146

Filed Mar. 24, 1975, Ser. No. 561,069
Int. Cl.² F02B *53/00*; **F01C** *1/08*; **F04C** *17/04*
U.S. Cl. 123—8.45 **3 Claims**

1. A positive displacement device employing a pair of parallel gear wheels which are rotatable on separated axes, gear teeth circularly disposed on the face of each of said wheels which teeth intermesh with said teeth on the opposite of said wheels, a housing and core member sealingly disposed between said wheels which define a generally annular track in which said teeth revolve, said teeth dividing said track into sealed working chambers whose volumes each contract and expand twice during one revolution of said chambers in said track, port means for providing the ingress and egress of fluid, respectively, to and from said chambers,

said housing including at least one divider block which in conjunction with said core member defines a ported pass

through which said teeth travel during rotation of said gear wheels, said block having an interior surface which is sealingly contacted by at least one of said teeth at all times to restrict the leakage of fluid and prevent free communication through said pass.



3,965,870

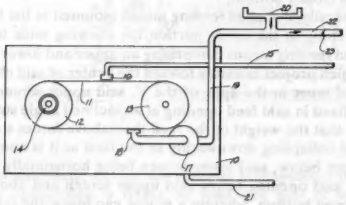
METHOD OF OPERATING AN INTERNAL COMBUSTION ENGINE WITH SOLVENT REFINED COAL AS A FUEL

Wallace Clark, 1830 S. German Church Road, Indianapolis, Ind. 46239

Filed Mar. 3, 1975, Ser. No. 554,633

Int. Cl.² F02B *45/04*; F02D *19/04*

U.S. Cl. 123—23 **5 Claims**



1. The method of operating an internal combustion engine with SRC as a fuel, which includes the steps of

a. providing the SRC in finely divided form and substantially free of sulfur and ash,

b. aspirating the finely divided SRC into an internal combustion engine cylinder during the suction stroke of the piston in said cylinder,

c. causing said finely divided SRC to liquefy in the form of a fine spray during the compression stroke of said piston, and

d. providing a glow plug in the cylinder above piston travel whereby said fine liquid spray is ignited by said glow plug to produce a power stroke of said piston.

3,965,871

CONVERTER VAPORIZER

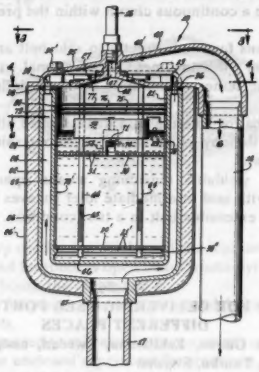
Clyde M. Morton, 11525 S. Ramona, Hawthorn, Calif. 90250

Filed Mar. 22, 1974, Ser. No. 453,590

Int. Cl. F02d *19/00*

U.S. Cl. 123—25 B **14 Claims**

1. In combination with a combustion engine having and an intake manifold an exhaust means from the engine, the combination of a converter vaporizer for converting water into vapor and introducing a mixture of air and the moist gaseous vapors to said combustion engine intake manifold, said converter vaporizer comprising a heat exchanger having respective outer and inner walls in nested relationship and in spaced relationship and forming a vein for engine hot exhaust emissions, a hot exhaust emissions inlet from said exhaust means to said vein and an exhaust emissions outlet from said vein to said exhaust means at a location downstream from said hot emissions inlet, said inner wall forming a cylindrical chamber for water having a top and an inner floor, a water inlet passage to said chamber and a vapor outlet passage from said chamber adjacent the upper end, a flow control in said water inlet passage and bouyant means in said chamber having an operative connection to said flow control, there being a selected liquid level in said chamber determined and maintained by said flow control, an air supply passage means from the exterior of the chamber to a location adjacent to the inner floor of the cylindrical chamber, baffle means in said chamber between said inner floor and said liquid level, a vacuum line communicating between the engine intake manifold and said vapor outlet passage from the chamber, said vapor outlet passage being at a location above said liquid level, and dispersing means in the chamber between said liquid level and said vapor outlet passage forming a dispersing passageway for water vapor particles to said vapor outlet passage for transmission to the engine intake manifold.



3,965,872

MAIN COMBUSTION CHAMBER OF SWIRL CHAMBER TYPE DIESEL ENGINE

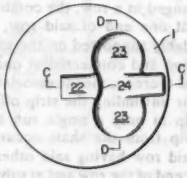
Kaoru Taira, and Hirotoshi Inoue, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 3, 1975, Ser. No. 538,264

Claims priority, application Japan, Aug. 6, 1974, 49-093367[U]

Int. Cl.² F02B *3/00*, *23/00*

U.S. Cl. 123—32 C **3 Claims**



1. In a swirl chamber type diesel engine comprising a piston, a main combustion chamber comprising a straight inclined groove formed in the top surface of said piston, said straight groove extends diametrically from an edge portion of said surface and becoming shallower as the groove

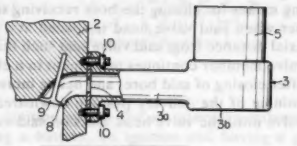
extends inward from said edge portion, said main combustion chamber further comprising a pair of twin-leaved recesses, each one of said pair of twin-leaved recesses extending from substantially the mid portion of a respective one of the pair of opposing straight sides of said straight inclined groove.

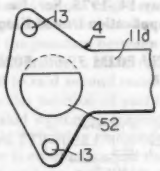
3,965,873

FLOW EQUALIZING MEANS

Tsohiaki Konomi; Joji Nurita, both of Susono, and Yasushi Tanazawa, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Nov. 1, 1973, Ser. No. 412,021
Claims priority, application Japan, July 12, 1973, 48-77871
Int. Cl.² F02H 75/18
U.S. Cl. 123—52 M 2 Claims





1. An intake manifold for a multicylinder internal combustion engine of the type including a riser connected to a carburetor and branch pipes connecting the riser to intake ports of respective cylinders of the engine, the manifold being separable from the engine at an interface lying in a plane intersecting respective portions in each of the branch pipes, wherein the improvement comprises:

a flat gasket inserted at said interface and having orifices located at said positions in said respective branch pipes for limiting the cross-sectional flow area at each of said positions to a preselected magnitude for equalizing the pressure drops across said orifices, wherein each orifice is defined by an arc of a circle approximately concentric with, and of equal diameter to, the respective branch pipe, and a horizontal chord joining the upper ends of said arc.

3,965,874

IGNITION TIMING CONTROL APPARATUS

Noriaki Kawai, Okazaki, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 19, 1974, Ser. No. 534,469
Claims priority, application Japan, July 9, 1974, 49-080295
Int. Cl.² F02P 5/04
U.S. Cl. 123—117 A 3 Claims

1. Ignition timing control apparatus for an internal combustion engine comprising:

a first diaphragm means and a second diaphragm means, said first and second diaphragm means each individually controlling an advancer drive connected to a distributor,

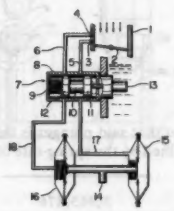
a change-over valve,

means responsive to the operating condition of the engine for controlling the change-over valve,

a first vacuum port opening into a suction pipe of said engine and detecting the vacuum in accordance with an operating condition of said engine,

a second vacuum port opening into said suction pipe at the upstream side of said first vacuum port and detecting the vacuum which is less than the vacuum detected at said first vacuum port and may be substantially zero under low and high load operating conditions of said engine; and

said change-over valve fluidly interconnecting said first diaphragm means with said first vacuum port in the suction pipe and not fluidly interconnecting said second diaphragm means with said second vacuum port in the suction pipe when the engine is in cold operation or



warming up so that when the engine is in cold operation or warming up said first diaphragm means communicates with said first vacuum port through said change-over valve to advance ignition timing in response to the vacuum from said first vacuum port, and said change-over valve fluidly interconnecting said second diaphragm means with said second vacuum port in the suction pipe and not fluidly interconnecting said first diaphragm means with said first vacuum port in the suction pipe when the engine is in a condition other than cold operation or warming up so that when the engine is in a condition other than cold operation of warming up said second diaphragm means communicates with said second vacuum port through said change-over valve to advance ignition timing in response to the vacuum from said second vacuum port.

3,965,875

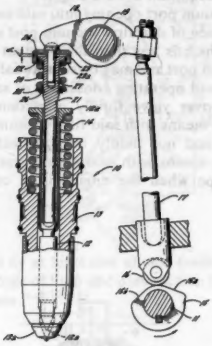
FUEL INJECTION SYSTEM FOR DIESEL ENGINES

Julius P. Perr, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed July 2, 1973, Ser. No. 375,350
Int. Cl.² F02M 39/00
U.S. Cl. 123—139 AY 11 Claims

1. In a fuel injection system for a diesel engine having an injection train connected between the camshaft of the engine and the plunger of the fuel injector for operating said plunger in synchronism with the rotation of said camshaft, said injection train having a predetermined spring rate, the improvement comprising auxiliary spring means connected in series with said injection train and having a spring rate lower than that of said injection train for advancing said plunger at a slow rate determined by the spring rate of said auxiliary spring means in response to a predetermined reaction force on the

tip of said plunger, and means for rendering said auxiliary spring means ineffective in response to a predetermined de-



flection thereof so that said plunger is thereafter advanced at a fast rate determined by the spring rate of said injection train.

3,965,876

FUEL INJECTION PUMPS FOR INTERNAL COMBUSTION ENGINES

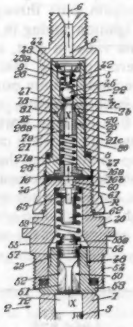
Raymond Tissot, Bron, France, assignor to Sigma Diesel, Venissieux, France

Filed Dec. 9, 1974, Ser. No. 531,197

Claims priority, application France, Dec. 13, 1973, 73.44650

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 **8 Claims**



1. A fuel injection pump for an internal combustion engine, comprising:

a pump assembly including a cylinder and a piston reciprocable in said cylinder to deliver liquid fuel from said cylinder during an active portion of a delivery stroke of the piston;

structure defining a delivery passage and a return flow passage for fuel between said cylinder and a linking passage for connection to an injector;

a normally closed delivery valve positioned in the delivery passage in said structure in alignment with said cylinder and responsive to pressure in the delivery passage to open during the active portion of the delivery stroke of the piston to allow fuel to be delivered to the linking passage; and

a normally closed return flow valve positioned in the return flow passage in said structure in alignment with said cylinder and responsive to the exceeding of a given pressure difference between the linking passage and said cylinder to open to allow fuel to flow back from the linking passage towards said cylinder;

said return flow valve including a permanently open axial passage forming part of the delivery passage;

in which pump the improvement comprises;

a third valve disposed in said structure upstream of said return flow valve and operative to open and close in the same sense as said delivery valve, said third valve comprising a movable valve member slidable in a bore forming part of the delivery passage in said structure, a valve head on said movable valve member, a valve seat formed at one end of the bore receiving said movable valve member, and resilient means biasing the movable valve member into a closed position in which said valve head engages said valve seat, said movable valve member including means for closing the bore receiving said valve member when said valve head is spaced at a predetermined axial distance from said valve seat such that said movable valve member continues movement in a closing direction after closing of said bore, and hence increases the closed volume of the delivery passage downstream of the third valve until the valve head seats on said valve seat.

3,965,877

FREQUENCY TO VOLTAGE CONVERTERS

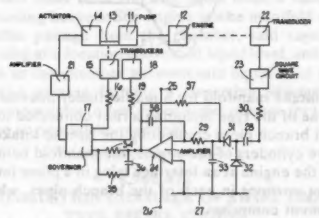
Anthony John Adey, Slough, England, assignor to C.A.V. Limited, Birmingham, England

Filed May 14, 1975, Ser. No. 577,357

Claims priority, application United Kingdom, May 31, 1974, 24212/74

Int. Cl.² F02M *39/00*; F02D *1/04*

U.S. Cl. 123—139 E **4 Claims**

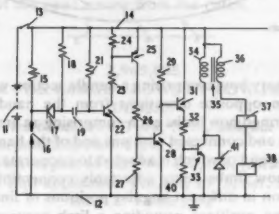


2. A fuel supply system for an engine comprising in combination a pump supplying fuel to the engine, a first transducer measuring pump output, a second transducer measuring demand, transducer means measuring engine speed, and an electronic governor to which the signals from the first and second transducers and the transducer means are supplied, the governor controlling the pump output, said transducer means comprising a pulse generator producing pulses at a frequency dependent upon the rotational speed of the engine, an operational amplifier which is powered by first and second supply lines, and has its output terminal connected to the governor and its non-inverting input terminal connected to a third supply line at a potential between the potentials of the first and second lines, a resistor connected in series with first and second similarly poled diodes between the inverting input terminal of the amplifier and the third line, a first capacitor connected between the output of the pulse generator and the junction of the diodes, a second capacitor connected between the junction of the first diode and the resistor and one of the supply lines, a feedback resistor connected between the output terminal of the amplifier and the junction of the first diode and resistor, and a third capacitor connecting the output and inverting input terminals of the amplifier.

3,965,878
SPARK IGNITION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Peter Hugh Salway, Birmingham, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Jan. 10, 1974, Ser. No. 432,230
Claims priority, application United Kingdom, Feb. 10, 1973, 6687/73
Int. Cl.² F02P 1/00
U.S. Cl. 123—148 E 1 Claim

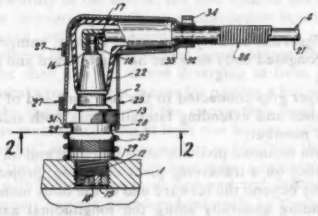


1. A spark ignition system for an internal combustion engine, including a battery, an ignition coil having a primary winding of relatively low impedance, a switching transistor in series with said primary winding across said battery, means for turning said transistor on to store energy in the winding and off to produce a spark, said last-mentioned means comprising contact breaker means, a first resistor in series with said contact breaker means across said battery, a second resistor and a diode connected in series between the positive terminal of said battery and the junction between said first resistor and said contact breaker means, a third resistor and a capacitor arranged in parallel to said second resistor, and an input transistor connected to the junction of said third resistor and said capacitor, and to said switching transistor, the arrangement being such that said switching transistor is conductive when said input transistor is conductive and the latter transistor will remain conductive as long as said capacitor charges upon closing of said contact breaker means, while said capacitor discharges via said diode and first resistor upon opening of said contact breaker means.

3,965,879
RADIO FREQUENCY INTERFERENCE SUPPRESSION APPARATUS

Arthur O. Fitzner, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Mar. 26, 1974, Ser. No. 454,803
Int. Cl.² H04B 15/02; H01R 13/46; F02P 11/00
U.S. Cl. 123—148 P 18 Claims

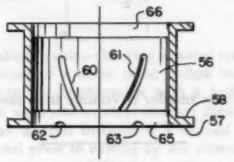


1. An ignition connection apparatus for interconnecting of a pulse signal to an igniting means of an internal combustion engine, comprising an ignition lead including a conducting element for carrying of the high voltage pulse signal and having a resistance on the order of 600 ohms per foot, said conducting element being wound on a magnetizable core to form a distributed inductive-resistive series impedance element and constituting the only inductance connected in the system, and a shield element applied over said lead to define a distributed capacitive shunt impedance, said shield is constructed to overlie the igniting means and defining an essentially uninterrupted shield, said shield including an extension in the form of a flexible coil wound about the lead with a plurality of abutting turns.

3,965,880
AUTOMOTIVE REAR MAIN BEARINGS

Ronnie L. Michael, 1040 W. Enid, Mesa, Ariz. 85202

Filed Feb. 18, 1975, Ser. No. 550,814
Int. Cl.² F01M 1/00
U.S. Cl. 123—196 R 9 Claims



1. In an automotive internal combustion engine having a crank shaft mounted within the engine block and including at least a rear main bearing and a rear main seal, the improvement comprising in combination:

a. a two part rear main bearing for providing a bearing surface intermediate the engine block and the crank shaft, said bearing including an upper half and a lower half; and

b. at least one channel disposed within said lower half bearing for conveying a flow of oil, said channel extending rearwardly from the front longitudinal edge of the bearing surface to a point short of the rear longitudinal edge of the bearing surface; whereby, the oil outflow intermediate the crank shaft and said rear main bearing surface is directed toward the front longitudinal edge of the bearing surface and away from the rear main seal.

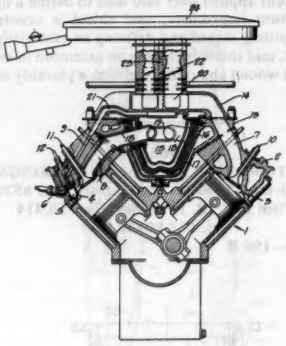
3,965,881
INTERNAL COMBUSTION ENGINE

Yoshitoshi Sakurai, Kawasaki; Takao Okura, Ooimachi, and Miniru Tanaka, Chofu, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed July 12, 1974, Ser. No. 487,998
Claims priority, application Japan, July 18, 1973, 48-80253
Int. Cl.² F02B 3/00
U.S. Cl. 123—32 SP 9 Claims

1. In an internal-combustion spark-ignition piston engine having a plurality of cylinders each provided with a main combustion chamber and an auxiliary combustion chamber connected by a torch nozzle restriction, the improvement comprising in combination: first passage means including main valved intake passages for supplying a lean air-fuel mixture to each of said main combustion chambers, second passage means including auxiliary valved intake passages for supplying a rich air-fuel mixture to each of said auxiliary combustion chambers, a valved exhaust passage leading from each main combustion chamber, a main exhaust gas reaction chamber, a plurality of auxiliary exhaust gas reaction chambers connected to receive hot exhaust gases from the exhaust passages and each having walls extending into the interior of said main reaction chamber, said walls having a discharge opening communicating with said main reaction chamber,

each of the auxiliary reaction chambers being substantially larger in cross-section than each said exhaust passage and



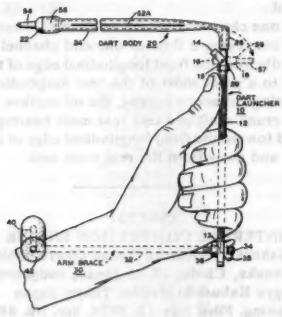
being substantially smaller in volume than said main reaction chamber.

3,965,882

SELF-PROJECTING ELASTIC TYPE PROJECTING DEVICE

Henry Ehrens, Bayside, and Frank Nonnenmacher, Brooklyn, both of N.Y., assignors to Allenwood Sports, Inc., Allenwood, N.J.

Filed Apr. 25, 1974, Ser. No. 463,884
Int. Cl.² F41B 7/02
U.S. Cl. 124—18 **6 Claims**



1. A self-powered dart system comprising a self-powered dart and a dart launcher for launching said self-powered dart,

A. said dart launcher comprising

1. a handle, and
2. a launching post pivotally connected to one end of said handle;

B. said self-powered dart comprising

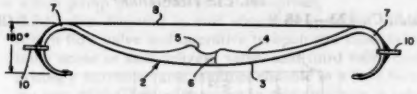
1. a stretchable elongated flexible tube having a plurality of peripherally-spaced longitudinal slits extending substantially its full length,
2. a weighted head positioned at one end of the tube, and
3. a means at the other end of the tube for detachably receiving and holding in a telescoping fashion the launching post of said dart launcher whereby when the tube is pulled to a cocked position the post will be prevented from pivoting rearwardly by a stop and when the dart is released the post will pivot forwardly and permit the dart to be detached from the post.

3,965,883

ARCHERY BOW

Leonard S. Meyer, 6449 Bridgewood Road, Columbia, S.C. 29206

Filed Aug. 9, 1972, Ser. No. 278,932
Int. Cl.² F41B 5/00
U.S. Cl. 124—24 R **3 Claims**



1. An archery bow comprising a handle section with its ends projecting in opposite directions from the hand grip, and separably formed bow limbs each comprising an arcuate member with one end connected with one end of the handle section and the other end of which is adapted to cooperate with a bow string, the bow limbs being adjustably connectible with the handle section in different angular positions of limb recurvature including positions providing a limb recurvature of at least 55°.

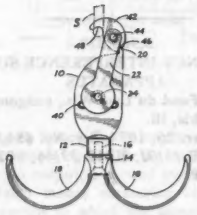
2. An archery bow comprising a handle section and bow limbs each recurved from the handle section in a direction toward the tension side of the bow and each having a string nock adjacent its extremity, a bowstring extending between and connected to each nock, the recurvature of the convex surface of each bow limb, measured between the line tangent to said convex surface at the nock point and the line of the string, being at least 90° when the bow is strung but not drawn, and the bow limbs consisting essentially of elastic material having a minimum elongation of about 4% and a maximum tangent flexural modulus of elasticity of 2,000,000.

3,965,884

TRIGGERLESS ARCHERY BOW STRING RELEASE

Gerald I. Killian, 16016 SE. 82nd Drive, Clackamas, Oreg. 97015

Filed Mar. 14, 1975, Ser. No. 558,269
Int. Cl.² F41C 19/00
U.S. Cl. 124—35 A **8 Claims**



1. A triggerless archery bow string release, comprising:

a. an elongated body member having forward and rearward ends,

b. a finger grip connected to the rearward end of the body member and extending laterally from both sides of the body member,

c. an arm mounted pivotally at its rearward end on the body member on a transverse pivot mounting, projecting forwardly beyond the forward end of the body member, and extending generally along the longitudinal axis of the body member,

d. a bow string support lever mounted pivotally intermediate its ends of the forward end of the arm,

e. a catch on one end of the lever,

f. pawl means operatively associated with the body member for releasably engaging the catch for releasably securing

the lever by rotating the body member in one direction about the pivotal axis of the arm to move the pawl means away from the catch to release the lever from cocked position and by rotating the body member in the opposite direction and rotating the lever so that the means will engage the catch, and

g. bow string retainer means on the opposite end of the lever for supporting a bow string when the lever is in said cocked position and for releasing a bow string when the lever is pivoted to uncocked position upon disengagement of the pawl means from the catch.

3,965,885

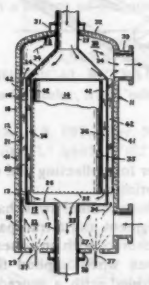
HEATER FOR LARGE FLOWS AT LOW PRESSURE LOSSES

Peter von Wiesenthal, New York, N.Y., assignor to Heat Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 462,046, April 18, 1974, abandoned. This application Feb. 24, 1975, Ser. No. 552,109

Int. Cl.² F24H *3/02*

U.S. Cl. 126—110 R **1 Claim**



1. An air heater for a large flow of air to be heated at a low pressure loss, the heater comprising in combination: a cylindrical shell having a first end and a second end, a cylindrical sleeve mounted coaxially in the shell and having a first end and a second end each corresponding with that of the shell, the sleeve connected expandably by means of a bellows to the shell at one each of the shell and connected fixedly to the shell at the other end of the shell, the bellows positioned about the sleeve outwardly of the sleeve, the first ends of the shell and the sleeve converging to form a convection input passage therebetween, convection-input extended surface projecting from the sleeve into the convection input passage, the second ends of the shell and the sleeve diverging to form a radiant zone therebetween, hot gas means for passing a hot gas in turn through the radiant zone and the convection input passage, the hot gas means including at least one burner connected to supplies of fuel and oxygen as well as penetrating the shell to introduce the hot gas into the radiant zone, a cylindrical baffle mounted within the sleeve in its first end and defining a convection output passage boardered inwardly by the baffle and outwardly by the sleeve, air input means for introducing the air to be heated into the sleeve with the baffle organized to channel the air to be heated to the convection output passage, air output means for withdrawing the air to be heated from the convection output passage out of the heater, convection output extended surface projecting from the sleeve into the convection output passage.

3,965,886

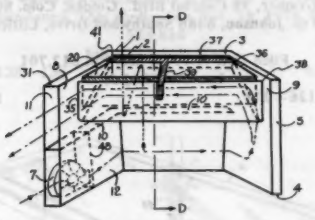
HOME FIREPLACE HEATING

Clifford H. Nelson, 9 Merry Point Terrace, Newport News, Va. 23606

Filed Oct. 15, 1975, Ser. No. 622,699

Int. Cl.² F24B *7/00*

U.S. Cl. 126—121 **4 Claims**



1. A free standing fireplace heating channel comprised of an assembly consisting of a three sided hollow metal room air conveying channel in combination with a hollow metal air conveying guide vane and control damper means for routing hot fire gases as desired through a V-shaped exhaust heat extraction channel prior to exiting up the chimney, insertible into an existing conventional fireplace without requiring modification to the fireplace structure, said air conveying channel having a center panel and two forward facing arms and adapted to fit against the three inside walls of a fireplace, said channel having adjoining walls exposed to the heat from the fire with corresponding rear walls spaced therefrom and connected by spacer means so as to form a suitable air channel for conveying room air to be heated by the fire, means for forcing room air into a lower portion of said forward facing channel arm by a single blower, and baffle means to direct the forced circulating room air to make multiple horizontal passes through said channel prior to exiting back into a room from an upper portion of a forward facing channel arm as useful heated air, said guide vane being symmetrically attached to the upper inside portions of said forward facing arms, said hollow metal guide vane having a triangular cross section with the base horizontal and the apex pointing downward and positioned forward of the center panel, said guide vane having a hollow interior vented into the hollow interior of said channel arms at the point of attachment whereby said vane becomes an additional conveying channel for heating circulating room air, said V-shaped exhaust heat extraction channel being formed by a V-shaped metal plate fastened to the upper inside walls of the forward facing arms of the air channel and positioned below and parallel to the underside surfaces of the guide vane and suitably spaced therefrom to form a conveying means for hot fire gases prior to exiting up the chimney, entrance opening for the hot fire gases into the said heat extraction channel is formed by locating the rearward horizontal edge of said V-shaped metal plate approximately equidistance from the inside lower surface of the guide vane and the center panel surface and the top surface of the free standing air channel, exit opening of said heat extraction channel is formed by positioning the forward horizontal edge of the V-shaped metal plate level with the guide vane base and leaving a small gap between said edge and the inside front surface of the fireplace throat, a converging upward passageway for hot gases after first leaving the fire is provided by the center panel surface and the inner upward sloping surface of the V-shaped metal plate, the said control damper means slides on top of the guide vane base and in the closed or rearward position covers the rear slot formed by the center panel top and the rear edge of the guide vane base and the two upper inside surfaces of the forward facing arms, said control damper in the rearward or closed position routes the hot fire gases into the said exhaust heat extraction channel, said control damper means is provided with a metal arm extending to the fireplace front to

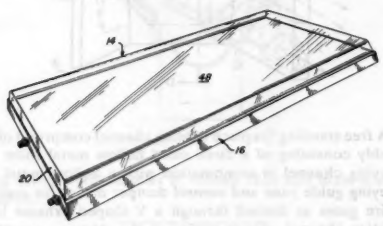
provide for manual control and as said control damper is moved forward the hot fire gases go directly up the chimney through the thus opened aforesaid near slot.

3,965,887

METHOD OF HEATING A LIQUID AND SOLAR HEATING PANEL THEREFOR

Eben J. Gramer, 98 Cabrini Blvd., Golden, Colo. 80401, and Melvin O. Johnson, 6488 Southwood Drive, Littleton, Colo. 80121

Filed Oct. 7, 1974, Ser. No. 512,701
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 14 Claims



1. A solar heating panel comprising:

a. a base member formed from an insulating material, said member having

i. a liquid impervious upper surface,

ii. a plurality of spaced apart fluid supply recesses formed in said upper surface and extending longitudinally therealong,

iii. inlet and outlet manifolds, each manifold extending transversely across one of the ends of said base member and each manifold being disposed in fluid communication with each of said recesses,

iv. an inlet port disposed in fluid communication with said inlet manifold,

v. an outlet port disposed in fluid communication with said outlet manifold,

vi. a fluid return recess formed in the upper surface of said base member along one side thereof, said fluid return recess being adapted to be placed in fluid communication with said outlet port, and

vii. a plurality of spaced apart strips formed on the upper surface of said base member, said strips being disposed intermediate each of said recesses and adjacent the outer side of the outwardly disposed recesses;

b. a rigid solar heat absorbing member formed from metal and mounted upon the upper surface of said base member in contacting engagement with each of said strips,

i. the upper surface of said solar heat absorbing member containing a black, solar radiation absorbing coating thereon,

ii. said solar heat absorbing member cooperating with said recesses to form liquid supply channels and a liquid return channel each of which is isolated one from the other,

iii. each liquid supply channel having a width to depth ratio varying between approximately 9 and 13.5, and

iv. each liquid supply channel having a mean hydraulic radius varying between approximately 0.018 and 0.023;

c. an inverted cup shaped member formed from a transparent material and secured to said base member, said cup shaped member having an upper, generally planar surface spaced apart from the upper surface of said solar heat absorbing member, said inverted cup shaped member permitting solar radiation to pass therethrough and impinge upon said solar heat absorbing member for all angles of solar radiation impingement from a direction normal to the upper surface of said solar heat absorbing member plus or minus less than 90 degrees; and

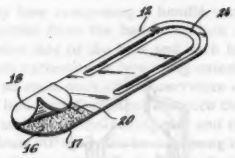
d. an elastic adhesive means for securing said solar heat absorbing member to said strips, said adhesive means having flat bonding characteristics over the environmental temperature range whereby thermal expansion of said base member relative to thermal expansion of said solar heat absorbing member occurs while maintaining a general planarity of the upper surface of said solar heat absorbing member.

3,965,888

SPECIMEN COLLECTOR AND HOLDER

Louis Bender, Scotch Plains, N.J., assignor to Brenner and Bender, Inc., Warren, N.J.

Filed Feb. 12, 1975, Ser. No. 549,164
Int. Cl.² A61B 10/00
U.S. Cl. 128—2 W 8 Claims



1. A specimen holder for collecting and enabling examination of specimen comprising

a unitary generally longitudinal swab having an integrally coupled handle segment and a transparent segment provided on one side thereof with an adhesive coated area to retain the specimen when applied thereto, said swab further being provided with a scored fold-line located across the transparent segment to enable the adhesive coated area to be folded back against a transparent portion of the swab for close adherence thereto with specimen protection and for visual examination of the specimen through the transparent segment of the swab.

3,965,889

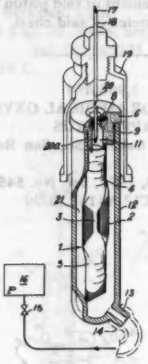
APPARATUS FOR THE SAMPLING OF BLOOD AND THE SEPARATION OF PLASMA UNDER ANAEROBIC CONDITIONS

Charles E. Sachs, Paris, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Continuation-in-part of Ser. No. 308,940, Nov. 24, 1972, abandoned. This application Jan. 3, 1975, Ser. No. 538,270
Claims priority, application France, Nov. 26, 1971, 71.42350
Int. Cl.² A61B 10/00
U.S. Cl. 128—2 F 4 Claims

1. Apparatus for the sampling of blood and the separation of plasma under anaerobic conditions comprising a transparent supple substantially non-extensible under conditions of use thermosealable walled container which can be inflated or flattened if under exterior vacuum or pressure, two separate substantially equal chambers in said container, a restriction connecting said two chambers, an open end for said container, a rigid top connected to said container at said open end, a central orifice in said top, an elastic washer closing said top mounted across said orifice, a screw thread on the external face of said top, a rigid container carrying tube, a bottom and an open end for said tube, a second orifice in the open end of said tube receiving said top, a screw thread in said second

orifice receiving the screw thread of said top to mount said supple substantially non-extensible thermosealable walled



container in said tube, and an opening in said tube adapted to communicate with a source of vacuum.

3,965,890

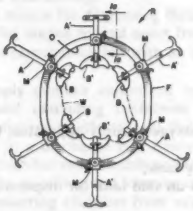
SURGICAL RETRACTOR

William Kohlmann Gauthier, 310 Codifer Blvd., Metairie, La. 70005

Filed Oct. 18, 1974, Ser. No. 515,857

Int. Cl.² A61B *17/02, 1/32*

U.S. Cl. 128—20 **11 Claims**



1. A surgical retractor comprising a frame means, retractor arm means carried by the frame means, retractor blade means carried by the arm means at one end of the arm means and depending therefrom for placement in an incised wound to hold the flesh out of the way of a surgeon, and pivot means pivotally mounting the blade means to the arm means for pivotal movement of the blade means about an axis disposed perpendicular to the axis of the arm means, said pivot means including a first fixed pin depending from the end of the arm means and pivotally received in an opening in the blade means for pivotal movement of the blade means about said first pin, said blade means rearwardly angularly inclined relative to said pivot axis whereby the blade is prevented from riding up out of an incision, a second fixed pin depending from the arm means in spaced relationship to the first pin and engaged at its lower end in an arcuate slot in an upper end portion of the blade means, so as to limit pivotal movement of the blade means to a predetermined angular displacement, and a movable stop pin carried by the arm and depending therefrom, said stop pin registerable with a hole in an upper end portion of the blade means so as to extend into said hole to preclude pivotal movement of the blade means, and actuating means connected with said movable stop pin to selectively retract said stop pin from said hole to enable said blade means to pivot about the first pin.

3,965,891

IUD PREPACKAGED IN A TUBULAR INSERTER

Irwin S. Lerner, Greenwich, Conn., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 447,262, March 1, 1974, Pat. No. 3,857,391, which is a continuation of Ser. No. 187,373, Oct. 7, 1971, abandoned. This application Nov. 18, 1974, Ser. No. 524,816

Int. Cl.² A61F *5/46*

U.S. Cl. 128—130 **13 Claims**

1. The combination of a resilient intrauterine device comprising a major portion, and laterally extending portion means, and an inserter for high fundal positioning of said intrauterine device, said inserter comprising an elongate tubular body having a front, cervix entry and intrauterine device expulsion end and a rear terminal end, and means for housing said major portion of said resilient intrauterine device within said tubular body with said intrauterine device being in a substantially undeformed configuration; whereby said intrauterine device may be deformed into an elongate shape within said tubular body prior to insertion of said inserter into placement position relative to a uterus and thereafter expelled into its substantially undeformed configuration within a uterine cavity.

3,965,892

UNDERWATER BREATHING APPARATUS

John R. Colston, Annapolis, and Wilbur J. O'Neill, West Severna Park, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 13, 1975, Ser. No. 549,567

Int. Cl.² A62B *7/00*

U.S. Cl. 128—142.3 **9 Claims**

1. Underwater breathing apparatus for a diver, comprising,

a diver-worn device for introducing breathing gas to and from a submerged diver,

a submerged chamber containing a source of breathing gas and relative to which bell the diver may change depth,

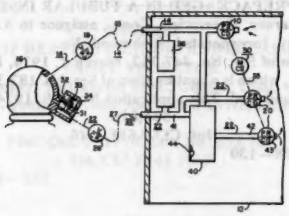
pump means at said chamber for moving such gas simultaneously to and from said diver-worn device,

motor means at said chamber for operating said pump means,

flexible supply and return hose means extending between said pump means and said diver-worn device for conveying the gas being moved therebetween,

exhaust control valve means at said diver-worn device for maintaining gas pressure therein at slightly above the surrounding hydrostatic pressure, and

differential-pressure control means responsive to supply and return pressures of said gas in said hose means at said



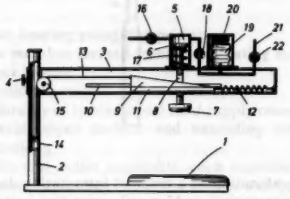
chamber for maintaining a substantially constant differential between such pressures in said hose means, respectively.

3,965,893

ARTIFICIAL RESPIRATION APPLIANCE

Franz Ragailler, Schmiegstrasse 6, Eferding, Austria

Filed May 21, 1975, Ser. No. 579,670
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.8 **7 Claims**



1. An appliance for subjecting a human patient to artificial respiration, which comprises

a cushion adapted to be disposed under the back of the patient,

a fixed support,

a piston-cylinder actuator carried by said support and comprising a piston,

a source of an inhalable gas under superatmospheric pressure,

a reservoir which is adapted to expand in response to its internal pressure,

a respiration mask adapted to be applied to the face of the patient,

an inlet valve connected between said source and said actuator and adapted to admit inhalable gas from said source to said actuator on one side of said piston,

an outlet valve connected between said actuator and said reservoir and adapted to release inhalable gas from said actuator on said one side of said piston into said reservoir,

a conduit which incorporates a shut-off valve and which connects said reservoir to said respiration mask,

first spring means opposing a movement of said piston under the influence of said inhalable gas admitted to said actuator from said source,

second spring means opposing the expansion of said reservoir,

ram means adjustably mounted relative to said fixed support structure for engagement with the chest of said patient and which is connected to said piston to be forced against the chest of said patient by the movement of said piston under the influence of said inhalable gas admitted to said actuator from said source,

stop means arranged to limit the movement of said piston under the influence of said inhalable gas admitted to said actuator from said source, and

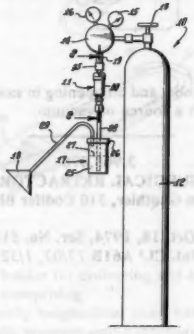
adjusting means for simultaneously adjusting said stop means in direct response to the adjustment of said ram relative to said support into engagement with said chest, whereby said stop is moved to a position in which said stop limits said movement of said piston to an extent that depends on the diameter of said chest.

3,965,894

MOISTURE TRAP FOR MEDICAL OXYGEN SUPPLY APPARATUS

Ernest J. Fischer, 384 Cardiff St., San Bernardino, Calif. 92408

Filed Jan. 30, 1975, Ser. No. 545,616
Int. Cl.² A61M *16/00*
U.S. Cl. 128—194 **4 Claims**



1. In a medical oxygen supply apparatus, the combination of:

an oxygen supply tank;

a valve provided on said tank for dispensing oxygen therefrom;

an oxygen flow regulator connected to said valve and receiving freshly released compressed oxygen therefrom through an in-flow pressure valve and having an output stem means providing a minute flow regulating orifice through which said oxygen is delivered from said flow regulator;

a water trap means having an input conduit connected with said output stem and extending downward therefrom whereby said oxygen delivered therefrom flows downwardly through said water trap means said water trap means lower end having output means;

an oxygen humidifier having an input connected with said output means of said water trap means to receive said flow of oxygen and cause the same to bubble upwardly through a body of water and thus become humidified and having an output means; and

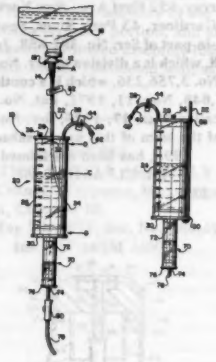
oxygen mask means connected to said output means of said humidifier for receiving said humidified oxygen from said humidifier and delivering the same to a patient,

said water trap means entrapping water sucked from said humidifier by vacuum occasioned in said regulator by shutting said tank valve or said regulator in-flow valve and thereby protecting said minute oxygen delivery orifice from calcification by said water.

3,965,895
APPARATUS FOR CONTROLLED VOLUME AND RATE ADMINISTRATION OF LIQUIDS

William C. Dabney, Oakland, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Aug. 21, 1974, Ser. No. 499,199
Int. Cl.[2] A61M 5/16
U.S. Cl. 128—214 C 20 Claims



1. Apparatus for selective controlled volume administration of a parenteral solution and the like from a fluid supply container, comprising:

a. a substantially rigid measuring chamber having a top wall and a bottom wall;

b. said bottom wall having:

1. an outlet means for dispensing fluid therefrom, and

2. a fluid inlet means spaced apart from said outlet;

c. an airway in communication with an opening in said top wall; and

d. a fluid supply conduit connected to said fluid supply container and extending therefrom continuously and interiorly uninterruptedly to said fluid inlet means and terminating in a discharge end freely opening into said measuring chamber substantially at the interior of bottom wall, whereby splashing and foaming of liquid introduced into said measuring chamber from said supply container is eliminated; and

e. means fixedly positionally securing the discharge end with respect to said bottom wall.

3,965,896
BLOOD AUTOTRANSFUSION METHOD AND APPARATUS

Roy L. Swank, 4400 SW. Scholls Ferry Road, Portland, Oreg. 97225

Filed June 17, 1974, Ser. No. 479,764
Int. Cl.[2] A61M 5/14, 1/02
U.S. Cl. 128—214 R 9 Claims

1. The method for autotransfusing blood during a surgical procedure involving a bleeding open wound in which blood accumulates in the wound, comprising:

a. providing conduit means having a first end in communication with the wound and a second end in communication with a blood circulatory member of the patient, said conduit means having a blood storage reservoir intermediate its ends,

b. intermittently partially evacuating said reservoir to thereby intermittently suck blood from said wound into said first end, through said conduit means, and into said reservoir,

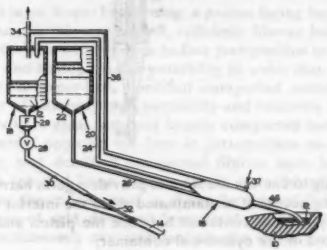
c. adding a blood anticoagulant to the blood adjacent said first end as the blood is removed from the wound in an amount predetermined to prevent the coagulation of the blood,

d. promptly filtering the anticoagulant containing blood as it flows though the conduit means to remove harmful components before the blood enters the reservoir,

e. accumulating the anticoagulant treated and filtered blood in the reservoir below the inlet of the conduit means into said reservoir, whereby the blood is retained in the reservoir without drying,

f. the evacuation of said reservoir and the addition of said anticoagulant being controlled at a location adjacent the first end of said conduit means,

g. And returning said reservoir to atmospheric pressure and withdrawing blood from the bottom end of the reservoir and returning it to the circulatory system of the same patient from whom it was collected.



3. Apparatus for autotransfusing blood during surgical procedures involving a bleeding wound in which blood collects in the wound, comprising:

a. a blood storage reservoir having passageway means at its upper end for communicating said reservoir with a source of vacuum,

b. first conduit means for interconnecting the wound with the reservoir and second conduit means for interconnecting the reservoir with a blood circulatory member of the patient,

c. a hand holdable sub-assembly on said first conduit means adjacent the end remote from the reservoir, said sub-assembly comprising: (1.) blood filter means in said conduit means, (2.) dispensing means for dispensing blood anticoagulant into the blood as it is removed from the wound and before it enters the filter means, and (3.) means for controlling communication between said passageway and said source of vacuum;

d. and blood cycling means in said second conduit means for returning the filtered blood to the circulatory member of the patient.

3,965,897
MEASURED VOLUME DRUG ADMINISTRATION DEVICE FOR USE WITH INTRAVENOUS FEEDING PUMP

Ingemar H. Lundquist, Oakland, Calif., assignor to Origo, Incorporated, Hayward, Calif.

Filed Oct. 11, 1974, Ser. No. 514,219
Int. Cl.[2] A61M 5/14, 5/315
U.S. Cl. 128—214 R 6 Claims

1. A drug measuring and mixing device adapted to be inserted in the flow system from a container of parenteral fluid to an intravenous feeding pump, which device comprises:

a. A cylindrical container having an inlet and an outlet end;

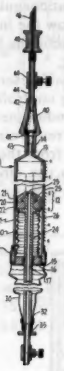
b. a piston within said cylindrical container;

c. a stem secured to said piston and extending out of said cylindrical container;

d. said piston and said stem being formed with a passageway extending through said piston and said stem and leading

to a point beyond the outlet end of said cylindrical chamber;

e. and a cylindrical flexible member secured between the piston and one end of the cylindrical container and serving to enclose the stem to provide a germ barrier preventing access of contaminated air to the interior wall of said cylindrical container between the piston and the outlet end of the cylindrical container;



3,965,898

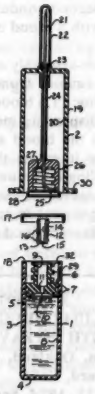
SYRINGE

Harold S. Cloyd, Erie, Pa., assignor to Nosco Plastics, Inc., Erie, Pa.

Filed Feb. 18, 1975, Ser. No. 550,628

Int. Cl.[2] A61M *5/00*

U.S. Cl. 128—220 **9 Claims**



1. A vial having tubular side walls with means for closing one end and with the other end open,

a piston received in coaxial with the vial having a head presented to the closed end of the vial, a first coupling element presented to the open end of the vial, means on the piston sealing engagement with the side walls of the vial, and an open way of smaller diameter than the piston extending axially through the piston,

a plug of diameter smaller than the piston received in and closing said way, said plug having means in sealing engagement with said way, a passageway in said plug having one end presented to the open end of the vial and the other end presented to the closed end of the vial, and a diaphragm across and closing said passageway, said passageway having a portion for receiving a needle for puncturing said diaphragm to establish communication between the contents of the vial and the needle.

3,965,899

HYGIENIC DOUCHE SYSTEM

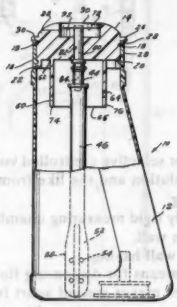
Jerome L. Murray, 652 First Ave., New York, N.Y. 10016, and Frances R. Gardiner, 43 Park Road, Sparta, N.J. 07871

Continuation-in-part of Ser. No. 382,658, July 26, 1973, Pat. No. 3,871,518, which is a division of Ser. No. 231,336, March 2, 1972, Pat. No. 3,756,236, which is a continuation-in-part of Ser. No. 197,848, Nov. 11, 1971, Pat. No. 3,756,230. This application Mar. 17, 1975, Ser. No. 558,954

The portion of the term of this patent subsequent to Sept. 4, 1990, has been disclaimed.

Int. Cl.[2] A61M *3/00*

U.S. Cl. 128—225 **8 Claims**



1. A hygienic douche apparatus comprising:

a container open at one end adapted to hold a quantity of liquid,

a closure member for sealing said open end of said container,

means defining a chamber within said container when said closure member is in sealing relationship on said container comprising a housing and a cover member therefor slidably disposed with respect to said housing and movable between a first sealed position and an unsealed second position,

said chamber adapted to hold a predetermined quantity of a compound capable of generating gas pressure to dispel completely the said quantity of liquid from said container when said compound is contacted by said liquid,

said cover member including means cooperable with said housing for sealing said chamber to preclude liquid contacting said compound in said chamber comprising cooperable means on said cover and said housing to effectively seal said chamber when said cover member is in said first position,

means cooperable from the exterior of said chamber to move said cover member from said first position to said second position to cause liquid within said container to enter said chamber and to contact said compound and generate sufficient gas pressure within said container to dispel the quantity of liquid from said container, and

means affording fluid communication between the interior of said container and the exterior for the passage of said quantity of liquid from said container after said compound is contacted by said liquid.

g. nipple-closing removable cap means including integrally connected nipple caps and tethers connected with said container closure member;

h. complemental coacting labyrinth type sealing means and inclined thread-like lug means on said container neck portion and on downwardly depending annular skirt-like wall means on said closure member, said coacting lugs constructed and arranged to provide screw-like attachment of the closure member to said container body; and

i. wherein said labyrinth type sealing means and the relative relationship of said thread-like lugs of said closure member and neck are such as to provide both

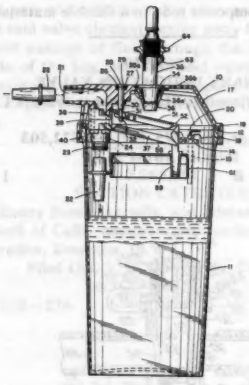
initial manual at least partial assembly of the closure member with the container neck portion, and also

subsequent automatic continued assembly responsive to the pull of a vacuum source connected with said first nipple means.

3,965,903
SUCTION BOTTLE ASSEMBLY

Bidwell Chapman Cranage, Ferguson, Mo., assignor to Chemetron Corporation, Chicago, Ill.

Filed May 23, 1975, Ser. No. 580,496
Int. Cl.² A61M *1/00*
U.S. Cl. 128—276 **10 Claims**



1. A suction bottle assembly for effecting drainage from a patient, comprising:

a. a bottle;

b. a cover mounted on said bottle and providing an airtight seal therewith, said cover having an inlet means adapted to be connected to a source of vacuum and also in communication with the interior of said bottle, said cover having intake means adapted to be connected to a patient and which is also in communication with the interior of said bottle;

c. a bracket means hingedly connected to the interior of said cover generally adjacent said inlet means:

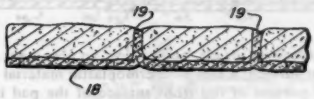
d. vacuum relief means located in said cover; and

e. a float connected to said bracket, said float rising vertically as the drainage enters said bottle and moving said bracket to contact said vacuum inlet means to close same and to open said vacuum relief means.

3,965,904
DISPOSABLE DIAPER

Frederick K. Mesek, Downers Grove, and Virginia L. Repke, Oak Forest, both of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 18, 1975, Ser. No. 559,624
Int. Cl.² A61F *13/16*
U.S. Cl. 128—284 **17 Claims**

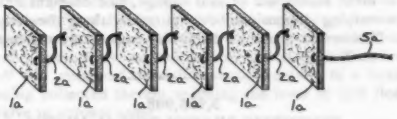


1. A multi-layer diaper comprising: a porous facing layer; a highly porous, loosely compacted, cellulosic fibrous batt of greater lengths than width in face-to-face juxtaposition to said facing layer and having greater wettability to water than said facing layer; a paper-like, densified compacted cellulosic fibrous layer of relatively high wettability and relatively high fluid retentivity integral with said loosely compacted batt on the face thereof opposite the face in juxtaposition to said facing layer; said densified compacted fibrous layer being thickened in selected linear regions across the width of said batt and near the ends thereof to direct the flow of fluid to selected areas of said densified layer; said densified layer extending continuously over substantially the entire area of said batt except for the region between the ends and said selected regions, and a water impervious backing sheet adhered to said densified layer.

3,965,905
CATAMENIAL TAMPON

Daniel Schoenholz, Basking Ridge, and Myron S. Weinberg, Livington, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 271,453, July 13, 1972, abandoned.
This application Sept. 24, 1975, Ser. No. 616,231
Int. Cl.² A61F *13/20*
U.S. Cl. 128—285 **6 Claims**



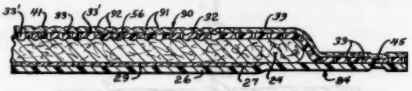
1. An intravaginal catamenial tampon which is suitable for insertion in the vagina by means of an applicator and which comprises a multiplicity of absorbent dimensional units attached to one another by means of a thread, each of said units having a front planar surface and a rear planar surface wherein the distance between said surfaces defines the width dimension of said unit, each surface of said units having an attachment point wherein said front planar surface attachment point of one unit is connected by said thread extending from said front planar surface attachment point to the rear planar surface attachment point of the next most adjacent unit, the size of the absorbent units and the length of said thread being such that the absorbent units cannot touch one another when the tampon is fully extended, and wherein said front planar surface of one of said units abuts said rear planar surface of the next adjacent unit when said tampon is assembled in said applicator.

3,965,906

ABSORBENT ARTICLE WITH PATTERN AND METHOD

Hamzeh Karami, Crystal Lake, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Feb. 24, 1975, Ser. No. 552,464
Int. Cl.² A41B 13/02; A61F 13/18
U.S. Cl. 128—287 15 Claims



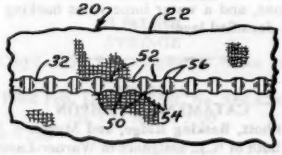
1. An absorbent article, comprising: an absorbent pad having a front surface, a film of thermoplastic material covering at least a portion of the front surface of the pad in a fluid receiving region of the article, a fluid pervious top sheet covering said film in said region, said top sheet having an outer surface facing away from the film, said film having a plurality of fluid transmitting openings extending through the film in said region, and said top sheet being fused against the film in a pattern defining a recessed configuration in the outer surface of the top sheet.

3,965,907

SURGICAL SPONGE

David R. Hardy, and Richard C. Weatherford, both of Augusta, Ga., assignors to The Kendall Company, Boston, Mass.

Filed Jan. 8, 1975, Ser. No. 539,358
Int. Cl.³ A61M 35/00; A61F 13/00
U.S. Cl. 128—296 14 Claims



1. A surgical sponge, comprising
an absorbent fabric; and
an elongated radiopaque filament integrally bonded to fibers in said fabric to prevent dislodgment of said filament during use of said sponge, said filament having a varying dimensional configuration along the length of filament to provide a distinctive pattern of the filament on an X-ray.

3,965,908

SYNTHETIC PHYSIOLOGICAL MUCUS

Albert E. Posthuma, 3520 Burton Ridge, Apt. D, and Robert C. Woodhouse, 1664 Alexander, SE., both of Grand Rapids, Mich. 49506

Continuation-in-part of Ser. No. 538,092, Jan. 2, 1975, abandoned, which is a division of Ser. No. 470,522, May 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 332,933, Feb. 16, 1973, abandoned. This application Nov. 26, 1975, Ser. No. 635,435
Int. Cl.² A61B 17/00; A01K 21/00; A61K 7/00
U.S. Cl. 128—303 R 22 Claims

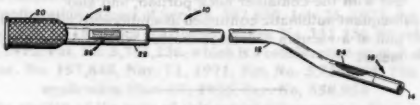
1. A body-inserted medical instrument having means for providing a slippery lubricated surface comprising, the medical instrument having a coating of a synthetic mucus-type lubricant dried on the surface thereof, said mucus-type lubricant being reconstituted to a slippery state upon exposure to an aqueous medium to define a lubricious surface whereby said instrument can be wetted just prior to use and can be inserted into a patient's body without the need to work with messy lubricating agents to prepare the instrument for body insertion.

3,965,909

ANGIOGRAPHIC CATHETER AND METHOD OF MANUFACTURE

Seid W. Waddell, Tarentum, and Marlin S. Heilman, Gibsonia, both of Pa., assignors to Medrad, Inc., Pittsburgh, Pa.

Filed Apr. 22, 1975, Ser. No. 570,998
Int. Cl.² A61M 25/00
U.S. Cl. 128—348 29 Claims



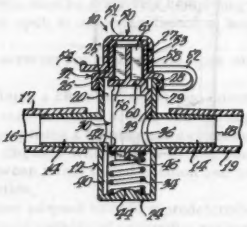
1. A method of manufacturing an elongated multiwall tube adapted for use as a catheter, the method comprising the steps of:
providing a first preformed elongated segment of flexible, tubular material;
encasing at least a portion of said first segment in a reinforcing braid sheath;
pulling said encased segment through a first heated die having an inside diameter less than the outside diameter of said encased segment to cause said segment to flow between the braids of said sheath to form a composite tube; and
encasing said composite tube in a flexible material.

3,965,910

URINARY IRRIGATION VALVE

Michael Fischer, Winnetka, Ill., assignor to Walpak Company, Wheeling, Ill.

Filed Apr. 28, 1975, Ser. No. 572,503
Int. Cl.² A61M 25/00
U.S. Cl. 128—349 R 11 Claims



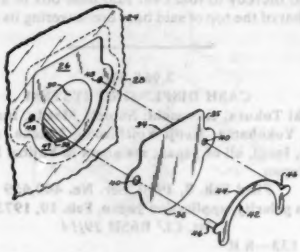
1. A urinary irrigation valve adapted to permit long term drainage and to permit solution from an irrigating syringe to flow into a bladder comprising a generally cross-shaped housing defining a first passage extending therethrough having an inlet and outlet, a second passage angularly disposed relative to said first passage, open-topped cap means on said housing adapted to cooperate in closing off said first passage, valve means controlling flow between said inlet and outlet and between said inlet and second passage, said valve means defining sealing means cooperating with said cap means for blocking flow through said second passage means when the valve means is in a first position and passage means permitting flow from said second passage through said inlet when the valve means is in a second position, said valve means also defining a passageway therethrough whereby said inlet and outlet are in communication when the valve is in said first position, and

3,965,900

ANTI-REFLUX DEVICE

Steven M. Boedecker, McHenry, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Oct. 2, 1974, Ser. No. 511,569
Int. Cl.² A61F 5/44
U.S. Cl. 128—275 17 Claims



1. An anti-reflux device for a collection bag having an inlet port communicating with the inside of the bag and a generally planar surface surrounding the port on the inside of the bag, comprising:

a thin flexible valve element having sufficiently large dimensions to cover the inlet port; and

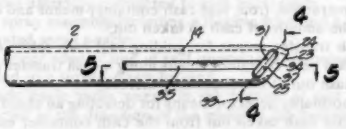
means for retaining said valve element adjacent said surface on the inside of the bag in a slidable relationship with the inlet port and with the valve element covering the port, with said valve element flexing away from the surface to permit passage of fluid through the inlet port into the inside of the bag, and with said valve element sealingly engaging against said surface responsive to pressure in the bag to prevent reflux of fluid from the bag to the inlet port.

3,965,901

SUCTION CATHETER

William Henry Penny, Arcadia, and Edmund E. Spaeth, Glendale, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 3, 1974, Ser. No. 511,622
Int. Cl.² A61M 1/00
U.S. Cl. 128—276 12 Claims



1. A medical suction catheter with a generally cylindrical flexible tube having a longitudinal bore extending between a front opening and a rear opening connected to a suction regulator, wherein the improvement comprises:

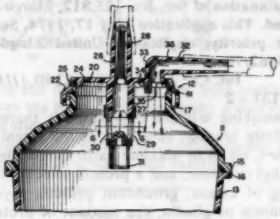
said flexible tube having two side openings with at least some portions of these side openings diametrically opposed from each other near the front opening, and each side opening has an area greater than one half the front opening's area, with the flexible tube between its front and rear openings being devoid of any other opening of equal or greater area than either one of its side openings, so that the front and side openings can coordinate suction forces for rapid removal of mucus from delicate tracheobronchial tissue to minimize suction damage to such tissue.

3,965,902

DISPOSABLE FLUID COLLECTION CONTAINER

Richard J. Reilly, Deerfield; Walter Goza Cornett, III, Wilmette, both of Ill.; James H. Riddle, Indianapolis, and David Wharmby, Noblesville, both of Ind., assignors to Respiratory Care, Inc., Arlington Heights, Ill.

Continuation of Ser. No. 344,412, March 23, 1973, abandoned. This application Oct. 17, 1974, Ser. No. 515,619
Int. Cl.² A61M 1/00
U.S. Cl. 128—276 3 Claims



1. A transparent completely disposable, vacuum-operated, body fluid collection container adaptable for single use particularly in pediatric as well as general surgical use, and disposable without need for emptying the liquid contents thereof, said disposable container comprising the combination of

a. transparent peripherally walled container body member having a transverse bottom wall, a generally dome-like top wall extending upwardly above a top portion of the transparent peripheral body wall and terminating in an upwardly extending annular neck portion centrally of the container body member;

b. said neck portion defining an aperture providing communication with the inside of said container;

c. a selectively removable closure member for normally closing said neck portion aperture, said closure member having an upwardly extending first nipple means communicating with a downwardly extending open-ended conduit means for collectively providing a part of said communication with the inside of said container, said first nipple means adaptable for connection with a vacuum source when in use;

d. said first nipple conduit means having its open end terminating generally above and not below the top portion of the peripheral body wall so as to be within said dome-like top wall, and having longitudinal, open cage-forming means at said open end with an axially movable float valve operatively retained the rein and adaptable to close off said open end conduit means responsive to a liquid being collected therein reaching the level of said float valve to actuate same;

e. said closure member also having a right-angle elbow conduit means spaced from said first nipple means and conduit and terminating at one end exteriorly of said container in a second nipple extending laterally in a direction away from said first nipple means, and having the other end terminating in a partially peripherally baffled opening within said closure adjacent to and partially baffled longitudinally to protectively shield said float valve and open end of said first nipple conduit means from incoming collected body fluid;

f. said second nipple means together with said elbow conduit means adaptable to provide communication access for body fluid being collected in said disposable container via a conduit connectable with said second nipple means, with said elbow conduit means adapted to retard fluid flow to reduce splash, said right angle elbow conduit including internally a deposit of anti-foaming means for introduction and mixture with said body fluid being collected prior to entrance of said fluid into said container;

resilient means in said housing normally biasing said valve into said first position, whereby an irrigating syringe can be employed to act on said valve means to block off the flow between the inlet and outlet of said valve and introduce an irrigating solution through said valve means into said inlet.

3,965,911
SMOKING MIXTURE

Robert Craig Anderson, and Robert Arthur Hall, both of West Kilbride, Scotland, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 125,812, March 18, 1971, abandoned. This application May 17, 1974, Ser. No. 471,148

Claims priority, application United Kingdom, Mar. 23, 1970, 13862/70

Int. Cl.² A24B *15/00*; A24D *1/18*

U.S. Cl. 131—2 **6 Claims**

1. A smoking mixture comprising a thermally degraded carbohydrate tobacco substitute as the essential smoke-producing fuel, alkali or alkaline earth carbonates, sodium carboxymethyl cellulose, and a protein selected from the group consisting of casein, groundnut protein, soyabean protein, zein, albumin or gliadin, the amount of protein to the said smoke producing fuel being in the range 1:8 to 1:60, the amount of alkali or alkaline earth carbonates to the said smoke-producing fuel, and the amount of sodium carboxymethyl cellulose to the said smoke producing fuel each being at least about 1:5 by weight and said thermally degraded carbohydrate being obtained by subjecting a carbohydrate material to a catalysed degradation process at a temperature of at least 100° C until the weight of the degraded material is approximately 90% or less of the dry weight of the original carbohydrate.

3,965,912
COIN STORING AND TRANSFERRING APPARATUS

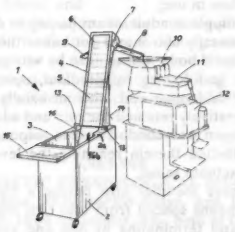
Erwin Gross, Bruchsal, Germany, assignor to Standardwerk Eugen Reis GmbH, Bruchsal, Germany

Filed Aug. 19, 1974, Ser. No. 499,009

Claims priority, application Germany, Aug. 20, 1973, 7330284[U]; Nov. 14, 1973, 7340676[U]

Int. Cl.² G07D *1/00*

U.S. Cl. 133—1 R **7 Claims**



1. An apparatus for storing and transporting coins comprising: a rectangular base box open on top and defining in its interior a coin receiving container; an elongated frame having a head at one end, means for pivotally securing the other end of said frame along one end of the top of said base box and means for supporting said frame so that its head end extends upwardly at an oblique angle from the interior of said container to a level above said base box, a conveyor provided with transverse parallel arrays of coin entraining pins protruding therefrom, said conveyor comprising a pair of parallel endless belts supported by said frame, each belt extending between lower roller means mounted within said base box and outer roller means mounted at the head end of said frame and provided with means for selectively driving said lower roller means to independently move said belts, said container having a bottom sloping toward said conveyor to direct the coins thereon, said bottom being provided adjacent said conveyor with a corrugated edge cooperating with said conveyor to agitate the coins, said frame being arranged to pivot together with the section of said conveyor supported thereby about a fulcrum to enable said frame and the section of the conveyor supported thereby to fold over said base box in a plane common to that of the top of said base box covering its open top.

3,965,913
CASH DISPENSING SYSTEM

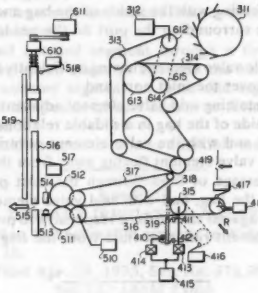
Katsuyuki Tokura, Kawasaki; Shuichi Maeda, Inagi; Takeshi Endo, Yokohama; Kenji Yoichizono, Mitaka, and Hiroshi Asami, Inagi, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Filed Feb. 8, 1974, Ser. No. 440,659

Claims priority, application Japan, Feb. 19, 1973, 48-20489

Int. Cl.² B65H *29/14*

U.S. Cl. 133—8 R **21 Claims**

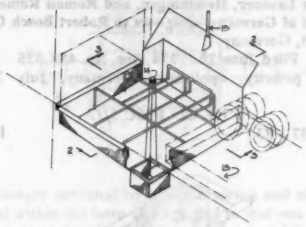


1. A cash dispensing system comprising:
cash container means for containing therein cash;
means for instructing the system as to the amount of cash to be dispensed;
cash counter means for taking out an amount of cash, as instructed, from said cash container means and counting the amount of cash so taken out;
cash transfer means for guiding said cash taken out from said cash container means along a cash transfer path to a cash outlet for dispensing thereof;
abnormality detector means for detecting an abnormality in said cash taken out from the cash container means and producing an abnormality detection output;
cash collecting means for collecting said cash taken out from said cash container in response to an abnormality detection output of said abnormality detector means;
counter means for counting the number of abnormality detection outputs of said abnormality detection outputs of said abnormality detector means; and
means responsive to an abnormality detection output produced by said detector means for a given said instructed amount of cash to be dispensed, to activate said means for taking out and counting the said instructed amount of cash, to again take out and count the said instructed amount of cash when said count of said abnormality detection output counter means is less than a predetermined value, and for stopping the dispensing operations when the count of said abnormality detection output counter means reaches a predetermined value.

3,965,914
COMMERCIAL DISHWASHER PRE-WASH STATION

James H. Walker, Jr., 4928 Salem Drive, Nashville, Tenn. 37211

Filed Feb. 6, 1975, Ser. No. 547,489
Int. Cl.² B08B 3/02
U.S. Cl. 134—104 4 Claims



1. A pre-wash station for use in commercial dishwashing operations where dishes stacked in a carrier are passed through the pre-wash station and sprayed with a forced spray of water, including:

a. a basin having vertical side walls with each side wall having an upper edge and a lower edge;

b. the upper edges of one set of opposing side walls form a first horizontal plane;

c. the lower edges of one set of connected side walls being askew to the upper edges of said side walls, respectively,

d. said basin having a bottom integrally connected to the lower edges of said side walls and askew to the said horizontal plane;

e. an outlet formed in the bottom of said basin at the lower portion of said basin;

f. a rack sitting in said basin and supported by the bottom of the basin;

g. said rack including support rods extending in the direction of travel of a dish carrier passing through the pre-wash station, said rods in a position to form a second horizontal plane coinciding with the first horizontal plane, vertically extending means connected to said rods for supporting said rods at said position, and connecting rods connecting said support rods and attached to the underside of said support rods,

h. one of said vertical walls being substantially perpendicular to the opposing walls whose upper edges form said first plane and extending vertically above the said plane to form a backsplash;

i. a spray assembly connected to said backsplash;

j. said spray assembly including a flexible hose and a hand-actuated spray nozzle;

k. the upper edge of one of said opposing walls being connected to a turned-down lip, and

l. a wide angle spray nozzle in the bottom of said basin directed in the direction of the plane of the bottom.

3,965,915
TENT STRUCTURE

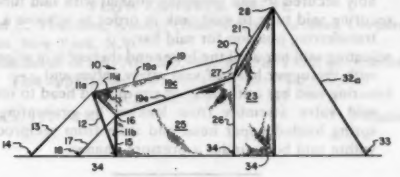
Arthur J. Kirkham, 24 W. Fifth South, Salt Lake City, Utah 84101

Filed Oct. 6, 1972, Ser. No. 295,516
Int. Cl.³ E04B 1/347; A45F 1/00
U.S. Cl. 135—1 R 8 Claims

1. A tent shelter comprising

flexible panel means forming an enclosable sleeping area having a low profile and including door flaps providing access means to the sleeping area;

flexible wing portions integral with and permanently secured to said flexible panel means, extending from around opposite sides of and upwardly from said door flaps, said wing portions being interconnected at upper ends thereof, whereby a shelter area having three ground engaging, interconnected sides and one entirely open side is formed by the flexible panel means forming an enclosable sleeping area and the wing portions, said shelter area having a higher profile than the sleeping area and a highest point at the intersection of the wing portions most remote from the panel means, whereby a user can stand within said shelter area; and

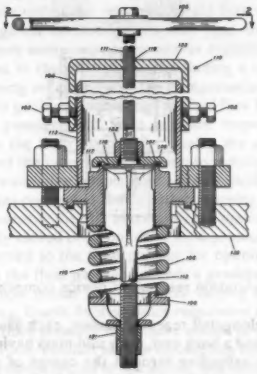


means for supporting said flexible panel means and said wing portions in an upright, taut condition.

3,965,916
APPARATUS AND METHOD FOR GAGGING A RELIEF VALVE WITHIN A FLUE SECURED TO A TANK

Gus Karas, Concord, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 23, 1974, Ser. No. 535,397
Int. Cl.³ F16K 15/18
U.S. Cl. 137—15 4 Claims



1. Method for the purpose of sealing a leaky safety valve assembly in a tank containing gas under pressure, said assembly characterized by

an extended, hollow, and open-ended body passing through said tank so that one end opens into the interior of said tank and the other end opens into an environment exterior to said tank, said body attached to said tank;

a safety valve assembly reciprocable within said body due to pressure changes in said tank, said assembly having an expanded lower valve head;

a stem extending from said lower valve head and having an upper valve head, said upper valve head spaced a predetermined distance from said lower valve head;

a valve seat connected to said open-ended body, said seat cooperating with said upper head to close said open-ended body when said upper head is placed against said seat;

resilient means for keeping said upper head against said seat in a normally closed position, said resilient means located

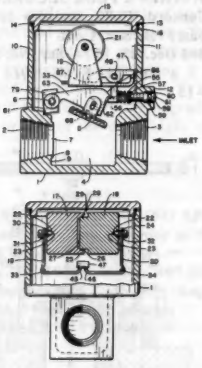
coaxial with said stem and between said lower valve head and said open-ended body;
a flue circumscribing said valve assembly and fixed to the exterior of said tank;
said method comprising the steps of:
placing over said flue a structural tube having a bar adjustably secured to and generally coaxial with said tube;
securing said tube to said tank in order to achieve a load-transferring position for said bar;
adjusting said bar until the lower end thereof is in alignment with the upper head of said safety valve; and
lowering said bar until said bar sits on said head to restrain said valve assembly from leaking by preventing said spring loaded upper head and stem from reciprocating within said body under a pressure change.

3,965,917

EARTHQUAKE VALVE

Ronald M. Speck, 8015 McGroarty St., Sunland, Calif. 91040

Filed Mar. 14, 1974, Ser. No. 450,982
Int. Cl.² F16K *17/36*
U.S. Cl. 137—38 **12 Claims**



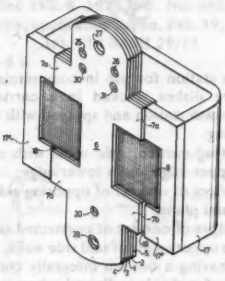
1. An acceleration responsive device comprising:
a housing;
a pair of elongated reactant masses, each said mass having a front and a back end, each said mass having a longitudinal axis extending through the center of gravity of the mass from said front end to said back end, said masses being loosely interlocked together with the front ends of said masses normally assuming an abutting relationship defining an inline interlocked first position but movable to a misaligned interlocked second position, said first position being with said longitudinal axes in alignment and located substantially horizontal;
supporting means for supporting said reactant masses, said supporting means mounted on said housing, said supporting means contacting each said mass on its respective said longitudinal axis, whereby the movement from said first position to said second position is substantially a rolling motion between said masses to thereby minimize the producing of friction in the movement, the rolling motion being produced due to point contact between said masses immediately upon said masses leaving said interlocked first position;
a latching means mounted upon said housing, said supporting means connectable to cause activation of said latching means when said reactant masses are in said second position; and
actuation means mounted on said housing, said latching means connectable to hold said actuation means in an inactive position, upon activation of said latching means said actuation means assumes an active position.

3,965,918

ELECTRO-FLUIDIC SIGNAL CONVERTER

Ludwig Finkbeiner, Walheim; Rudolf Jurinke, Ludwigsburg; Volkmar Leutner, Hemmingen, and Roman Romes, Friolzheim, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 28, 1974, Ser. No. 484,335
Claims priority, application Germany, July 3, 1973, 2333690
Int. Cl.² F15C *3/12*
U.S. Cl. 137—83 **11 Claims**



1. An electro-fluidic signal converter, comprising a body having an inlet and two outlets for pressure fluid, said body being composed of a pair of outer non-magnetic plates and a plurality of laminated-together inner magnetizable plates which are fluid-tightly sandwiched between said outer plates, said inner plates having respective plate portions which together constitute a body section that is resiliently deflectable out of a neutral position, and said body section being formed with a fluid channel which communicates with said inlet and which has a discharge orifice that communicates equally with both of said outlets when said body section is in said neutral position; and electromagnetic means adjacent said body and energizable for deflecting said body section out of said neutral position to one of a plurality of operated positions in which said discharge orifice communicates preferentially with one of said outlets, the non-magnetic character of said outer plates preventing shorting of the magnetic flux path required for effecting the deflecting of said body section.

3,965,919

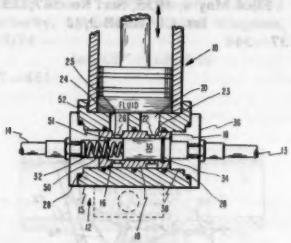
HYDRAULIC SAFETY VALVE BASE

Robert E. McGarvey, and Donald L. Gitthens, both of 5853 Owens, Arvada, Colo. 80002

Filed Sept. 26, 1974, Ser. No. 509,647
Int. Cl.² F16K *11/07*
U.S. Cl. 137—107 **7 Claims**

1. A safety valve for use in a hydraulic system, which system includes a hydraulic cylinder, hydraulic fluid, hydraulic fluid feed lines and hydraulic fluid control means, comprising:
a. A base member having a bore therethrough;
b. A first port and a second port located in the base member and perpendicular to the bore and joining the bore to the hydraulic cylinder;
c. A hollow cylindrical barrel positioned within the bore and having a first circumferential groove and a second circumferential groove, said first circumferential groove and said second circumferential groove each including a series of vents and each being aligned with the first port and the second port, respectively;

d. Inlet and exhaust fittings in the base member and cummunicating with a first end and a second end of the bore respectively; and



e. A plunger actuated by a single spring and slideably located within the bore and adapted to seal one or more of the ports or the other to prevent passage of the hydraulic fluid from the hydraulic cylinder to the bore.

3,965,920

INSTALLATIONS FOR MONITORING OIL CONTENT

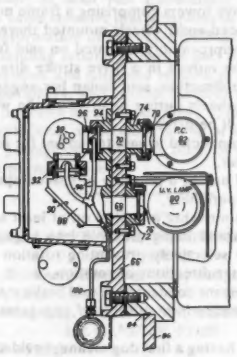
Raymond Michael deVial, Beckenham, England, assignor to Bailey Meters & Controls Ltd., Croydon, England

Filed Oct. 3, 1974, Ser. No. 511,748

Claims priority, application United Kingdom, Oct. 3, 1973, 46274/73

Int. Cl.² G05D *7/06;* **F16K** *37/00*

U.S. Cl. 137—115 **4 Claims**



1. An installation for monitoring the oil content in a discharge of water ballast from cargo tanks of an oil tanker including a sampling connection positioned adjacent a sea valve for the discharge and connected to receive a flow of water from the discharge, an emulsifier connected to receive a fraction of the flow of water from the sampling connection and discharge the fraction, after thorough mixing, to a plurality of downwardly discharging orifices having co-planar axes of discharge in a sampling chamber, a beam of ultraviolet radiation of wavelength in the range 200 to 400 n.m. arranged to be incident upon the jets discharged from the orifices, a photo-electric cell arranged to receive fluorescent radiation emitted from the jets at wavelength greater than 400 n.m. and an alarm circuit arranged upon the photo-electric cell receiving radiation greater than a pre-determined value, to energise a pneumatically operated alarm system by venting a pneumatic pilot pressure line connected to a pneumatic actuator for the sea valve and to a pneumatic actuator for a valve to a line to a slop tank for receiving water ballast unacceptable for discharge, such that upon loss of pilot pressure the slop tank valve is moved to an open position and the sea valve is moved subsequently to a closed position.

3,965,921

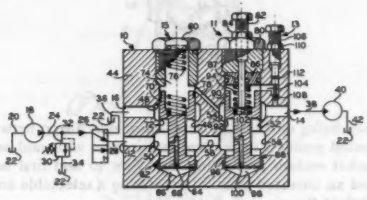
CONTROLLED OPENING PRESSURE COMPENSATED FLOW CONTROL VALVE

David L. Thurston, Ashley, Ohio, assignor to Abex Corporation, New York, N.Y.

Continuation of Ser. No. 260,946, June 8, 1972, abandoned. This application Nov. 20, 1974, Ser. No. 525,418

Int. Cl.² G05D *7/01, 11/03*

U.S. Cl. 137—117 **3 Claims**



1. An automatic pressure fluid flow control device, comprising: a valve body; an inlet in the body for receiving pressure fluid from a source; an outlet in the body for discharging pressure fluid to a pressure fluid operated device; a normally closed variable orifice for regulating fluid flow to the outlet; a fluid passage for conducting pressure fluid to the variable orifice; pressure compensating means for regulating fluid flow from the inlet to the fluid passage including a compensating member, biasing means biasing the compensating member to an inoperative position permitting full fluid flow from the inlet to the fluid passage, first fluid pressure responsive means connected to the fluid passage for biasing the compensating member out of the inoperative position to reduce fluid flow to the flow control valve means, and second fluid pressure responsive means connected to the outlet opposing the first fluid pressure responsive means; biasing means biasing the orifice to its normally closed position; third fluid pressure responsive means connected to the fluid passage for opening the orifice when fluid in the fluid passage exceeds a predetermined pressure; adjustment means for selectively varying the maximum orifice opening; fourth fluid pressure responsive means opposing the third fluid pressure responsive means to oppose opening of the orifice; conduit means connecting the fourth fluid pressure responsive means to the outlet; and restricting means in the conduit means to limit the flow of fluid from the fourth fluid pressure responsive means to the outlet to control the rate of opening of the orifice as the orifice opens.

3,965,922

ANTI-SIPHON FLUSH VALVE CONSTRUCTION

Robert R. McCornack, 980 N. Broad St., Galesburg, Ill. 61401

Filed Nov. 25, 1974, Ser. No. 526,796

Int. Cl.² F16K *24/00*

U.S. Cl. 137—218 **18 Claims**

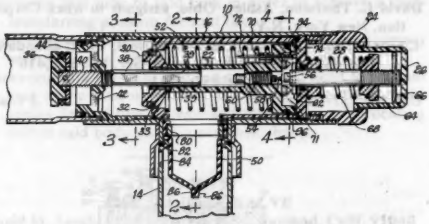
1. In a valve construction for controlling fluid flow through a first jacket section having a fluid inlet and outlet, a piston, means for mounting the piston for reciprocal and rotational movement in said jacket section, means for actuating said piston, a valve mounted to said piston to control fluid flow at the jacket inlet, the improvement comprising:

a. a socket provided in said piston at the inlet of said jacket section for receiving a shaft therein;

b. a second jacket section disposed forwardly of said first section;

c. a shaft threadingly engaged in said second section, the rear portion of said shaft extending to a position of engagement with said socket; and

d. a stop mounted to said shaft controlling fluid flow through the inlet end of said second jacket section, said



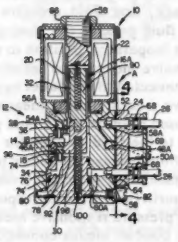
stop being movable by rotation of said piston between a seated position in sealing engagement with said second jacket section preventing fluid flow to said first section and an unseated position permitting a selectable amount of fluid flow.

3,965,923

SOLENOID VALVE

Walter E. Allen, Prospect, Conn., assignor to Peter Paul Electronics Co., Inc., New Britain, Conn.

Filed Aug. 16, 1974, Ser. No. 498,089
Int. Cl.² F16K 11/02
U.S. Cl. 137—315 **24 Claims**



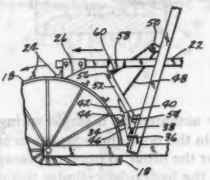
1. A solenoid actuated control valve comprising a body assembly having a chamber therein, a pair of opposing valve seats in said chamber, a solenoid mounted on said body assembly, an axially elongated plunger assembly supported for axially reciprocal movement in said chamber and including an axially elongated plunger axially movable from one to another position in response to energization of said solenoid and a rigid plunger arm extending radially outwardly beyond said plunger and having a pair of seating surfaces on opposite sides thereof radially outwardly spaced from said plunger, each of said seating surfaces aligned with an associated one of said valve seats, one of said seating surfaces engaging and closing one of said valve seats when said plunger is in its one position, the other of said seating surfaces engaging and closing the other of said valve seats when said plunger is in its other position, and means for biasing said plunger to and normally retaining it in its one position and yieldably resisting axial movement of said plunger to its other position on energization of said solenoid.

3,965,924

BRAKE MEANS FOR A CENTER PIVOT IRRIGATION SYSTEM

James M. Kennedy, 240 E. 6th St., Ainsworth, Nebr. 69210

Filed May 6, 1975, Ser. No. 567,725
Int. Cl.² B05B 3/12
U.S. Cl. 137—344 **6 Claims**



1. In combination,

a center pivot irrigation system comprising an overhead irrigation pipe supported by a plurality of spaced-apart drive towers,

each of said drive towers comprising a frame means having a pair of spaced-apart wheels mounted thereon,

a trojan bar reciprocatably mounted on said frame means adapted to be moved in a drive stroke direction and a return stroke direction, said trojan bar engaging at least one of said wheels during its drive stroke whereby said one wheel will be driven,

power means connected to said trojan bar for reciprocating said trojan bar,

said one wheel having a plurality of spaced-apart lugs provided on its periphery,

a brake means movably mounted on at least some of said drive towers and being movable into engagement with said lugs for selectively preventing rotation of said one wheel in either directions of rotation,

and a control means connected to said brake means to move said brake means into and out of engagement with said lugs,

said trojan bar having a first dog means provided on one end thereof for engagement with one of said lugs during its drive stroke to cause the said one wheel to be driven in a forward direction,

a second downwardly extending dog means on said trojan bar spaced longitudinally inwardly of said first dog means,

an elongated brake arm pivotally secured at one end to said frame means and extending upwardly therefrom,

said brake arm having a lug receiving notch formed therein adapted to receive one of said lugs at times to prevent rotational movement of said one wheel in either direction when so engaged,

an elongated actuator arm pivotally secured at one end to said frame means,

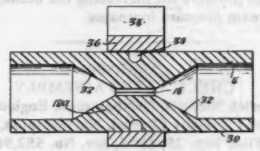
a cable means interconnecting said actuator arm and said brake arm,

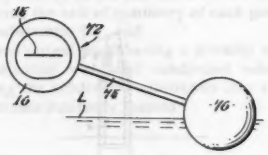
the other end of said actuator arm being in the movable path of said second dog means whereby said second dog means will engage and cause said actuator arm to be pivotally moved as said trojan bar is moving during its drive stroke to cause said brake arm to pivotally move out of engagement with said lug.

3,965,925
PINCH VALVE

John Henry Gooch, Hassocks, England, assignor to J. H. Gooch & Company Limited, Hassocks, England

Filed Mar. 17, 1975, Ser. No. 558,892
Claims priority, application United Kingdom, Mar. 18, 1974, 11817/74
Int. Cl.² F16K 7/06
U.S. Cl. 137—451 15 Claims



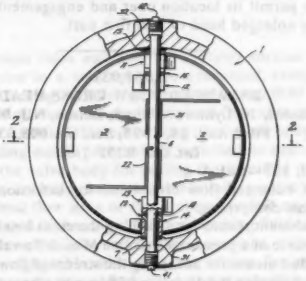


1. A valve comprising, in combination, a resilient tubular valve member, at least one transversely elongate passage through the valve member that is capable of being opened and closed by deformation of the valve member, an outer control member extending around at least a part of the periphery of the valve member and rotatable relative to the valve member about said periphery, said control member engaging different portions of the valve member periphery in respective positions of relative rotational adjustment in one of which it urges said at least one passage open and in another of which it urges said at least one passage closed.

3,965,926
FLAPPER VALVE WITH INDEPENDENT PLATE SUSPENSION

Spencer P. Buckner, Houston, Tex., assignor to TRW Inc., Cleveland, Ohio

Filed Aug. 25, 1975, Ser. No. 607,338
Int. Cl.² F16K 15/03
U.S. Cl. 137—512.1 4 Claims

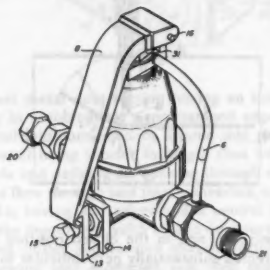


4. An improved valve of the type having a body with a fluid flow conduit therethrough, a valve seat surrounding said flow conduit, valve members for sealing said fluid flow conduit, a shaft for pivotally supporting said valve members within said body, and separate hinges for mounting said valve members on said shaft, wherein the improvement comprises a support collar attached to said shaft and interposed between two of said hinges supporting separate valve members whereby said collar supports the upper hinge of said two hinges.

3,965,927
OVERRUN VALVE FOR AIR PUMPS

Bernard W. Siczek, La Grange Park, Ill., assignor to Graco Inc., Minneapolis, Minn.

Filed Dec. 2, 1974, Ser. No. 528,708
Int. Cl.² F16K 17/00
U.S. Cl. 137—460 5 Claims



1. Apparatus for limiting volumetric flow rate in a gaseous pressurized line, comprising:

a. a valve body having an inlet and outlet connection for sealably connecting to the gaseous pressurized line;

b. a first chamber in said valve body in communication with said inlet and having a pressure responsive diaphragm defining at least a portion of its chamber wall;

c. a venturi passage having an inlet in communication with said first chamber and an outlet in communication with said valve body outlet connection;

d. a second chamber in said valve body having said pressure responsive diaphragm separating it from said first chamber;

e. passage means for connecting the region near said venturi passage outlet with said second chamber;

f. a valve interposed in said first chamber in gas flow opening and closing position, said valve having a connection to said pressure responsive diaphragm;

g. a mechanical latch connected to said valve body and having a latch-opening valve rod connected to said pressure responsive diaphragm, said latch further having a detent means for exerting a latch-holding force in opposition to force of said diaphragm on said latch-opening valve rod; whereby an unbalance of forces against said latch wherein said diaphragm force exceeds said latch-holding force of said detent means causes said valve to close; and

h. pressure responsive force means, connected between said first chamber and said detent means, for increasing said detent means latch-holding force in relation to increasing pressure in said first chamber.

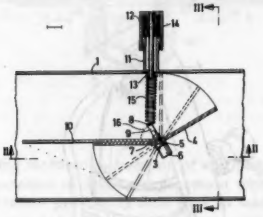
3,965,928
FLOW REGULATOR FOR DUCTS

Emil Siegwart, Michael-Blatter-Str. 6, 6603 Sulzbach-Neuweiler, Germany

Filed Oct. 9, 1975, Ser. No. 621,169
Claims priority, application Germany, Oct. 10, 1974, 2448271
Int. Cl.² F16K 31/36
U.S. Cl. 137—499 13 Claims

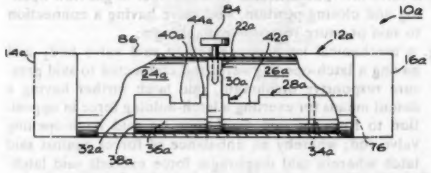
1. In a fluid ducting section, a flow regulator comprising a flap for varying the free ducting cross-section, a shaft mounted

transversely in the ducting section near the central axis thereof, said flap being mounted on said shaft for rotation about the shaft axis to vary the free ducting cross-section, said flap comprising first and second portions obtusely angled relative to each other along a bend line near said shaft, said ducting section having an air inlet end and an air outlet end defining the direction of air flow therethrough, means defining an open position and a closed position for said flap, said first and second portions being angled relative to each other such that in the open position of said flap the first portion is directed downstream from said shaft generally parallel to the direction of air flow and the second portion is directed



obliquely upstream, and in the closed position said second portion is directed substantially perpendicular to the ducting axis and said first portion is directed obliquely downstream, whereby air flow against said second portion biases said flap toward the closed position, and spring means biasing said flap toward the open position, said spring means being adapted to act from the direction of the wall of the ducting section on a lever arm attached to the shaft in such a manner that the point of action of the force on rotation of the flap out of the open position into the closed position describes a circular arc, which arc at the beginning is more oblique to the direction of the spring force than at the end.

3,965,929
CONDUIT VALVE
Akio Fukunaga, 2055 Colby Ave., Los Angeles, Calif. 90025
Filed June 17, 1974, Ser. No. 480,000
Int. Cl.² F16K *31/12*
U.S. Cl. 137—503 **9 Claims**



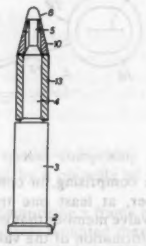
1. An in-linne fluid flow control valve comprising a partitioned housing upstream and downstream chambers and coupling means for coupling said chambers respectively to upstream and downstream conduits:

fluid passage defining means including first and second ports communicating respectively with said chambers and a slidable member having a recessed portion for permitting a flow between said ports and having opposite end portions for blocking flow between said ports, the slidable member having at least one downstream surface responsive to pressure in said downstream chamber for moving said member toward the upstream conduit coupling means; and

biasing spring means coupled to bias said slidable member toward the downstream conduit coupling means, the biasing spring being operative to drive the slidable member in a downstream direction to a first position permitting a first minimum flow in the absence of a predetermined downstream pressure range, to balance the slidable member in an intermediate position aligning the recessed portion with said ports for maximum fluid flow for downstream pressures within said predetermined range, and to permit the slidable member to be driven upstream by further increase in downstream pressure to a second position cutting off flow for downstream pressure in excess of said predetermined range;

said biasing spring means including means responsive to upstream pressure for increasing the biasing spring force as upstream pressure increases.

3,965,930
CHECK VALVE ASSEMBLY
Bryan Frederick Nicholls, Northampton, England, assignor to The Mettoy Company Limited, Northampton, England
Filed Feb. 25, 1975, Ser. No. 552,966
Claims priority, application United Kingdom, Mar. 5, 1974, 9919/74
Int. Cl.² F16K *15/14*
U.S. Cl. 137—525 **2 Claims**



1. In a non-return valve comprising a generally cylindrical valve member having opposed axial ends, an axial bore terminating at an inlet in one said end of the member, a pair of axially spaced walls projecting radially from said member and a circumferential sealing surface between said walls for carrying a close fitting sleeve of elastomeric material, and at least one radial passageway extending through said sealing surface and communicating with said bore, the improvement according to which said member is a synthetic plastics molding comprising two parts having snap-fitting interengagement; a first one of said parts defining said axial bore, one of said walls and said circumferential sealing surface and comprising an end portion located beyond the sealing surface having a radially enlarged head and the other one of said parts including the other of said walls, and being annular and resiliently deformable to permit its location over and engagement behind said radially enlarged head of said first part.

3,965,931
BALANCED FLOW CROSS-HEAD
Max Skobel, 10 Lynnwood Road, Edison, N.J. 08817
Filed Aug. 18, 1975, Ser. No. 605,637
Int. Cl.² B29F *3/02*
U.S. Cl. 137—561 A **5 Claims**

1. A balanced flow cross-head for extrusion of flowable materials comprising:

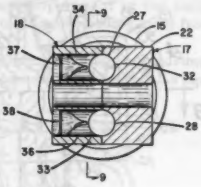
attachment means for attaching the cross-head to a suitable source of a pressurized stream of such flowable materials,

conduit means for accepting the stream of flowable material and turning the direction of flow away from the axis of the stream emanating from said source,

first flow dividing means in fluid communication with said conduit means for dividing said stream by a plane defined by the axis of symmetry of pressures in the conduit and the axis of stream flow as it emerges from said conduit

means after being turned, and for twisting each substream 90°,

second flow dividing means in fluid communication with the output of a first flow dividing means for subdividing each of the substreams emanating from the first flow dividing means said second flow dividing means positioned on the



axis of symmetry of the substreams and including means for twisting the axis of symmetry of each portion of each of the substreams 90°, and

a cross-head output plate having a plurality of fluid paths communicating with said subdivided substreams for spreading the subdivided substreams into a recombined single stream exteriorly thereto.

3,965,932

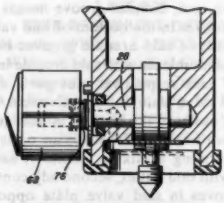
VACUUM VALVE

Lawrence E. Wysocki, and Elmer W. Muench, both of Covina, Calif., assignors to Everett/Charles, Inc., Pomona, Calif.

Filed Apr. 4, 1975, Ser. No. 565,243

Int. Cl.² F16K *11/18*

U.S. Cl. 137—607 **9 Claims**



1. A vacuum valve assembly for applying suction pressure from a source to a location to be evacuated, comprising a valve body having an inlet portion and a manifold portion, suction conduit means of predetermined flow area connected to said inlet portion for connecting the valve body to said source, sealing means peripherally mounted on said manifold portion of the valve body for sealing the manifold portion at said locaton enclosing an area substantially greater than said predetermined flow area of the suction conduit means, gate means mounted in the valve body for blocking fluid communication between the inlet and manifold portions, valve actuating means engageable with the gate means for selectively opening the same to unblock fluid communication between the inlet and manifold portions of the valve body and re-pressurizing means connected to the actuating means for venting the manifold portion of the valve body to atmosphere simultaneously with the blocking of fluid communication between the inlet and manifold portions.

3,965,933

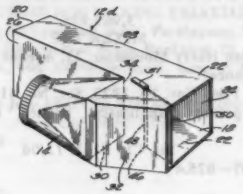
AIR DUCT MADE FROM SHEET METAL STAMPING

Patrick L. Beaudin, 1112 Fremont, NW., Grand Rapids, Mich. 49504

Filed Nov. 15, 1974, Ser. No. 524,225

Int. Cl.² F17D *1/02*

U.S. Cl. 137—610 **4 Claims**



1. A sheet metal duct section having an inlet and outlet comprising in combination: a prestamped upper and lower spaced panel interconnected by spaced side panels, at least one side panel being shorter in length than said upper and lower panels and defining an opening through which at least a portion of flow through said inlet is diverted, said upper and lower panels having end edges and a central body portion extending the length and width of said duct section from said inlet to said outlet and formed tongue portions extending laterally beyond said shortened side, said stampings being folded along their end edges and cooperatively engaged with said side panels to form the air duct section, and said tongue portions cooperatively forming a diverter outlet to divert flow through said inlet from said outlet, said duct having a diminishing cross section from said inlet to said outlet.

3,965,934

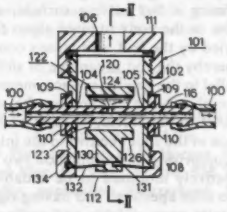
FLUID REGULATING DEVICES

Peretz Rosenberg, Moshav Bet Shearim, Israel

Division of Ser. No. 269,256, July 5, 1972, Pat. No. 3,882,890. This application Nov. 4, 1974, Ser. No. 521,004

Int. Cl.² B05B *1/08*

U.S. Cl. 137—624.14 **11 Claims**



1. A fluid-flow control device comprising a conduit member connectable to a source of pressurized fluid to be controlled and including an inlet opening, an axial passageway, and an outlet opening through which the fluid flows; and a regulating member movable towards and away from the conduit member outlet opening to close and open same and thereby to control the flow of fluid therethrough; characterized in that the face of the conduit member in which the outlet opening is formed is curved, and the face of the regulating member closing the outlet opening is also curved but with a different curvature from that of the conduit member face, such that the curved regulating member face diverges from the curved conduit member face outwardly from the periphery of the outlet opening formed in the latter face to provide a spacing between the two curved faces which increases from the periphery of the outlet opening outwardly thereof, whereby as the regulating member moves away from the conduit member outlet opening to permit the fluid to flow therethrough, a pressure gradient is produced in which the pressure is lower at the periphery of

said opening than outwardly thereof, and which therefore tends to move the regulating member towards the conduit member outlet to close same, said pressure gradient acting with the fluid force to set the regulating member into vibratory movement towards and away from the conduit member outlet opening during the flow therethrough.

3,965,935

MIXER TAP

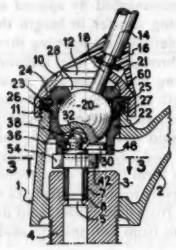
Bernard Jean Harry Morisseau, 22, Avenue de Friedland, 75 Paris, France

Filed Nov. 20, 1973, Ser. No. 417,526

Claims priority, application France, Nov. 29, 1972, 72.42368

Int. Cl.² F16K *11/06*

U.S. Cl. 137—625.4 **2 Claims**



1. In a mixer tap comprising means defining a body having a chamber and an end wall which defines a part of the chamber; means defining an outlet for the chamber; means defining two inlet apertures in side-by-side spaced relation opening onto the end wall; valve actuating means comprising a rigid hard slide defining a flat valving surface, a spherical ball mounted relative to the body to pivot about the centre of the ball, a rod carried by the ball, and means connecting the ball to the slide whereby the rod is capable of shifting the slide in directions parallel to the valving surface; means for supporting the slide in the chamber and allowing the slide to move in directions parallel to the valving surface while maintaining a given orientation of the slide relative to the inlet apertures: the improvement comprising in combination two rigid hard tubular seats respectively mounted to be slidable axially of the seats in the two inlet apertures and having rigid hard flat first ends defining inlet ports slidably and sealingly engaging the valving surface and opposite second ends, the inlet apertures defining inner shoulder means spaced from the second ends of the seats axially of the seats, a resiliently yieldable self-sealing assembly interposed between and in a compressed state between the second end of each seat and the corresponding shoulder means and radially sealingly engaging the corresponding inlet aperture whereby the seat is sealingly combined with the inlet aperture and has its first end biased gainst the valving surface, the support means providing a rigid abutment for the slide in a direction perpendicular to the valving surface, the slide having an outer contour which has two contour portions defining two lateral notches which extend the entire thickness of the slide and constitute valving edges of said flat valving surface which are respectively cooperable with the two ports to be capable of selectively closing for zero flow and uncovering for maximum flow the two ports selectively simultaneously and separately according to the orientation of the rod about the centre of the ball, the parts of the ports and seats uncovered by the slide valving edges of the notches being outside said outer contour of the slide.

3,965,936

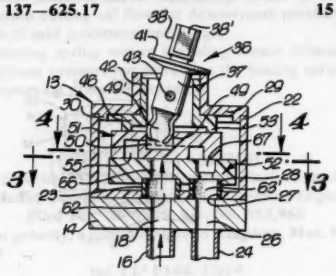
SINGLE HANDLED MIXING VALVE

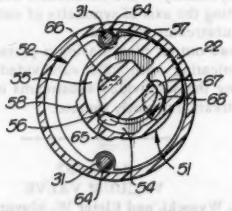
Jack K. Lyon, Pasadena, Calif., assignor to Price Pfister Brass Mfg. Co., Pacoima, Calif.

Filed Nov. 20, 1974, Ser. No. 525,293

Int. Cl.² F16K *19/00*

U.S. Cl. 137—625.17 **15 Claims**





10. In a valve structure, a valve body including a cup defining a chamber, a fitting supporting said cup, a cover positioned on said cup, a pair of inlet holes in said fitting and a pair of inlets in the bottom of said cup, said inlet holes communicating respectively with said inlets, a flat valve seat mounted in said cup above the bottom thereof, a pair of arcuately shaped outwardly divergent ports in said valve seat, said ports communicating with said respective inlets, a valve plate slideable on said valve seat, circular groove means comprising a pair of arcuate grooves in the bottom of said valve plate, first adjacent inner ends of said arcuate grooves being arranged respectively to communicate with said arcuate inlet ports over varying areas of said respective inlet ports during sliding movement of said valve plate on said valve seat, an outlet hole in said fitting, an outlet in the bottom of said cup, said outlet communicating with said outlet hole, an outlet port in said valve seat and forming a mixing chamber, said outlet port communicating with said outlet, second adjacent outer ends of said arcuate grooves in said valve plate opposite said first adjacent ends being positioned for communication with said outlet port in said valve seat, and a member mounted on said cover in slideable contact with the upper surface of said valve plate and confining said valve plate for slideable movement on said valve seat.

3,965,937

WASHBASIN FAUCET INSTALLATION WITH AUXILIARY FITTING FOR MOUTH SPRAY OR SIMILAR APPARATUS

Martin Reber, 7 Cours de Rive, Geneva, Switzerland

Filed Apr. 16, 1975, Ser. No. 568,392

Claims priority, application Switzerland, Apr. 18, 1974, 5336/74

Int. Cl.² F16K *11/085*

U.S. Cl. 137—625.47 **4 Claims**

1. A faucet for a washbasin, comprising

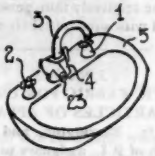
1. a support base defining a water inlet conduit,
2. a two-way cock mounted on the support base and comprising
   a. a cock casing defining a chamber arranged to receive water from the inlet conduit, a main water outlet conduit

and a branch water outlet conduit leading from the cock casing chamber,

b. a cock body movably mounted in the cock casing chamber between the inlet conduit and the outlet conduits, the cock body being movable into respective angular positions to establish communication between the inlet and main outlet conduits, and the inlet and branch outlet conduits, respectively,

c. the branch outlet conduit leading from the cock casing chamber to a first compartment in the casing and the casing defining two channels leading away from the compartment, and

d. the cock casing defining a second compartment in communication with one of the channels, a spring-biased



pressure limiting valve housed in the second compartment and normally closing communication between the one channel and the second compartment, excess pressure in the one channel opening the valve and permitting water to enter from the one channel into the second compartment, and the cock casing defining a third channel between the second compartment and the main water outlet conduit to permit water from the second compartment to flow into the main outlet conduit in response to said excess pressure,

3. a main water spout directed into the washbasin and in communication with the main water outlet conduit, and

4. an auxiliary water spout in communication with a second one of the two channels, the auxiliary spout serving for the attachment of a flexible tubing.

3,965,938

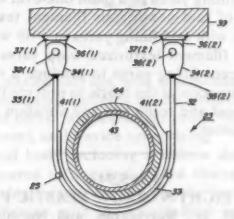
PIPE RESTRAINT DEVICE

Richard D. Bauerle; William A. Pitt, both of San Jose, and Mervyn A. White, Campbell, all of Calif., assignors to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 388,933, Aug. 16, 1973, abandoned. This application Nov. 11, 1974, Ser. No. 522,987

Int. Cl.² F16L *3/04*

U.S. Cl. 138—107 **11 Claims**



1. In a system including a pipe conducting a fluid at high pressure, a restraint device normally free of any contact with said pipe for limiting movement of said pipe in the event of rupture of said pipe, comprising: a U-shaped restraint member positioned around said pipe and normally spaced therefrom; support means adjacent each end of said restraint member, said support means being fixed to a structural member of said system; and a pivotable connection between each end of said restraint member and said support means, the material and size of said restraint member being selected to provide plastic elongation of said restraint member and absorption of energy of said pipe upon impact of said pipe against said restraint member in the event of said pipe rupture.

3,965,939

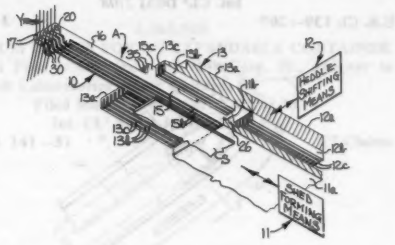
HEDDLE WITH GUIDE MEANS THEREON FOR USE IN A WEAVING MACHINE FOR MAKING TRIAXIAL FABRICS

Karol Kulczycki, 36 Lawrence Road, Parsippany, N.J. 07054; Burns Darsie, 1603 Sexton Drive, Rockford, Ill. 61108, and Norris F. Dow, 600 Allendale Road, King of Prussia, Pa. 19408

Filed July 18, 1975, Ser. No. 597,290

Int. Cl.² D03C *13/00*

U.S. Cl. 139—48 **9 Claims**



1. An elongate heddle for a weaving machine for making triaxial fabrics wherein the heddle is adapted to be moved longitudinally during warp shed forming operations and also is adapted to be shifted weftwise of the weaving machine, said heddle having a frontal portion with a warp strand guide opening extending therethrough, said heddle having means thereon adapted to be engaged for imparting longitudinal movement thereto, said heddle also having other means thereon adapted to be engaged for shifting the heddle weftwise of the weaving machine, and guide means carried by said frontal portion of the heddle and lying in a common plane with said frontal portion and projecting laterally therefrom for guiding said frontal portion of the heddle during movement of the heddle by being adapted to cooperate with an adjacent heddle.

3,965,940

RIGID AND FLEXIBLE MOUNTING FOR REED-DENT IN A PROFILED STAVE

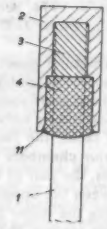
Emil Marty, 38 Plattenstrasse, 8810 Horgen, Switzerland

Filed Mar. 5, 1975, Ser. No. 555,748

Claims priority, application Switzerland, Mar. 6, 1974, 3181/74

Int. Cl.² D03D *49/62*

U.S. Cl. 139—192 **6 Claims**



1. In a textile weaving machine an improved reed-dent mounting arrangement comprising:

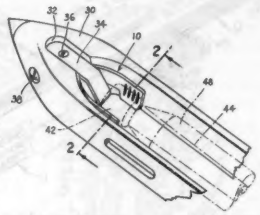
a. a plurality of reed-dents (1);
b. at least one stave (2) having a U-shaped cross-section to engage an end of the reed-dents;
c. a rigid bonding agent (3) surrounding the end of the reed-dent inserted into the stave so as to rigidly bond said reed-dent to said stave; and
d. a flexible bonding agent (4) surrounding the end of the reed-dent adjacent said rigid bonding agent so as to flexibly attach said reed-dent to said stave.

3,965,941

SHUTTLE SPRING

Ralph M. Compton, 4 Briarcreek Place, and Johnny W. Jenkins, Jr., 111 Sycamore Drive, both of Greenville, S.C. 29607

Filed May 8, 1975, Ser. No. 575,451
Int. Cl.² D03J *5/08*
U.S. Cl. 139—207 **3 Claims**



1. A shuttle spring for holding a bobbin having yarn wound thereon in a loom shuttle comprising:
a single piece of metal having a bent portion formed by bending said single piece of metal upon itself,
a pair of shank portions defined by the sides of said single piece of metal on each side of said bent portion,
a pair of spaced-apart jaw portions having opposed vertical side surfaces for resiliently engaging and holding said bobbin therebetween,
a side arm portion connecting, respectively, each one of said jaw portions to one of said shank portions, and
one of said vertical side surfaces having a greater vertical width than the opposing vertical side surface of said other jaw portion so as to cause said bobbin to rotate in a direction causing the yarn wound thereon to create an effective transfer tail when the bobbin is forced outwardly from said jaw portions of said shuttle spring.

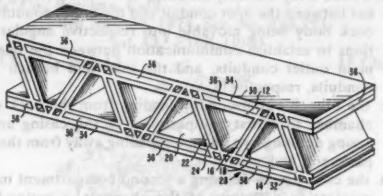
3,965,942

MULTI-PLY WOVEN ARTICLE HAVING STIFFENING ELEMENTS BETWEEN DOUBLE PLIES

Donald M. Hatch, Huntington Beach, Calif., assignor to Hitco, Irvine, Calif.

Continuation of Ser. No. 290,541, Sept. 20, 1972, abandoned. This application Oct. 9, 1974, Ser. No. 513,315
Int. Cl.² D03D *3/00*
U.S. Cl. 139—384 R **8 Claims**

1. A multi-ply woven structural panel comprising a woven fabric having a pair of opposite, spacedapart, generally planar faces and a pair of spacedapart intermediate rib plies of generally planar configuration extending between and being interwoven with the opposite faces, the faces and the rib plies defining a plurality of major chambers within the panel and between the opposite faces, the pair of intermediate rib plies alternately extending between the opposite faces in a zig zag configuration and providing the major chambers with generally triangular-shaped cross section, the pair of intermediate rib plies defining relatively thin, generally planar chambers which border the major chambers and have a thickness many times less than the thickness of the major chambers defined by the distance between the opposite faces, and a plurality of relatively thin, generally planar elements of size and shape



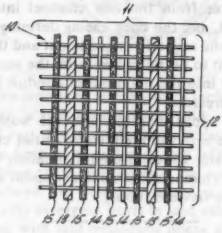
similar to and disposed within the relatively thin, generally planar chambers, the relatively thin, generally planar elements providing the panel with substantial strength and rigidity.

3,965,943

NARROW ELASTIC FABRIC FOR USE AS WAISTBAND IN ARTICLES OF APPAREL

Richard E. Goff, Jr., Barrington, and Normand D. Guay, Woonsocket, both of R.I., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 11, 1974, Ser. No. 522,570
Int. Cl.² D03D *15/08*; A41D *1/06*
U.S. Cl. 139—421 **5 Claims**



1. A narrow elastic fabric suitable for use as a waistband for an article of apparel comprising; a set of warp yarns running in the direction of the length of the fabric woven with a set of monofilament filling yarns running in the direction of the width of the fabric, the set of warp yarns contains elastic yarns and continuous filament synthetic fiber texturized yarns, said elastic yarns have a spandex core wrapped with a yarn that is set in its wrapped configuration, said elastic warp yarns being woven with the filling yarns in a plain one-over-one weave, at least a portion of said continuous filament texturized warp yarns are woven with said filling yarns in a rib weave wherein said continuous filament texturized warp yarns pass over at least three adjacent filling yarns to produce a rib running in the transverse direction of the fabric to provide the fabric with transverse stiffness and resiliency and abrasion resistant frictional gripping areas.

3,965,944

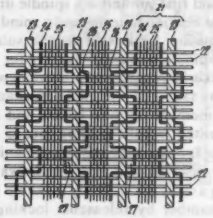
LIGHTWEIGHT NARROW ELASTIC FABRIC

Richard E. Goff, Jr., Barrington, and Normand D. Guay, Woonsocket, both of R.I., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 12, 1975, Ser. No. 549,605
Int. Cl.² D03D *15/08*, *19/00*
U.S. Cl. 139—421 **11 Claims**

1. A narrow elastic fabric comprising a set of warp yarns and a set of filling yarns, said set of warp yarns containing elastic yarns, nonelastic monofilament yarns and synthetic texturized yarns, each of said elastic yarns woven with a monofilament yarn so that each monofilament yarn is a leno

woven warp yarn forming a substantially uniform sine-wave shape, the crest of adjacent sine-wave monofilament yarns disposed in diametrically opposed alignment, a plurality of said texturized yarns disposed between each pair of leno woven yarns, the filling yarns woven with the synthetic texturized yarns in a one-by-one plain weave between adjacent leno woven monofilament warp yarns and said synthetic texturized yarns floating over or under at least three adjacent filling yarns



between adjacent leno woven elastic warp yarns, said fabric woven under tension so that when the fabric is relaxed said monofilament sine-wave yarns contract in the warp direction with said opposing adjacent crests being drawn closer to each other, said texturized yarns being squeezed in the plane of the fabric between said closely opposing adjacent crests and being spread out into a soft, fluffy condition in those areas not between opposing crests.

3,965,945

FILLING AID FOR MEDICANT SYRINGE

John D. Ross, Box 5541 NWJC, Senatobia, Miss. 38668

Filed Sept. 9, 1974, Ser. No. 504,100
Int. Cl.² B65B *3/04*; A61M *5/18*
U.S. Cl. 141—27 **5 Claims**

1. An aid device for use with a medicant syringe which includes an elongated barrel, a needle projecting axially from one end of the barrel, and a plunger projecting from the other end of the barrel; said device comprising:

an elongated body including a hollow sleeve and an end piece secured to one end of the sleeve; said body end piece having means for clamping the barrel of a medicant syringe thereto, with the longitudinal axis of the syringe barrel aligned in parallel relation with the longitudinal axis of said body, and including means for preventing axial movement of the syringe barrel relative to said aid device;

an elongated, threaded shaft disposed longitudinally within said body, and mounted in said end piece for relative rotation and limited relative axial movement; said body sleeve having a longitudinal slot in one side wall; a lug threadedly mounted on said threaded shaft having a tab projecting radially through said body slot, whereby rotation of said shaft effects longitudinal movement of said lug along said body;

said lug tab being disposed to be engaged by the plunger of said medicant syringe clamped to said device; and said lug being selectively positionable relative to said body end piece, to limit the extent of withdrawal of the syringe plunger;

said threaded shaft being mounted within said device end piece for limited axial reciprocating movement, said end piece and said shaft having coacting stop means for limiting said reciprocating movement;

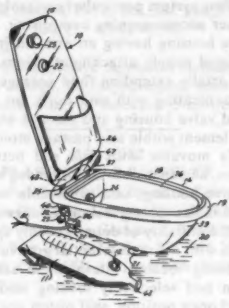
spring means for normally urging said shaft to its limiting position toward the end piece end of said device; and said reciprocating shaft movement defining an overfill control, allowing overfill of the syringe and subsequent ejection of the overfill medicant to remove any entrapped air.

3,965,946

VACUUM DEVICE FOR AN EXPANDABLE CONTAINER

Herbert Fred D'Alo, Oakwood Hills-Cary, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 6, 1975, Ser. No. 555,763
Int. Cl.² B65B *3/04*, *3/16*, *31/09*
U.S. Cl. 141—51 **17 Claims**



1. A device for introducing a flowable material into an expandable container having a sealable inlet port comprising:

a base member constructed and arranged to accommodate said container therein;

a cover member;

pivoting means securing said cover member to said base member to define a closed compartment;

sealing means disposed between said base and cover members, said base member adapted to be secured to a support in a stationary position and to remain in said position throughout usage of said device;

an opening in said cover member to permit access to said sealable inlet port in said container;

a vacuum passage communicating from inside said compartment to the outside;

a pocket member carried by said cover to position said sealable inlet port in said opening in said cover and to fully support said container when in a substantially vertical position, said pocket member partially supporting said container when in a substantially horizontal position;

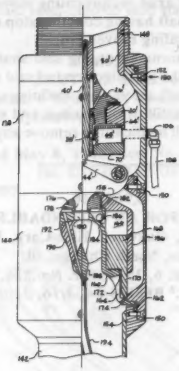
and means carried by said cover member or said base to release a vacuum in said compartment.

3,965,947

TANK FILLING SYSTEM EMPLOYING EMERGENCY SHUT-OFF VALVE

Richard L. Easton, and Richard A. Buseth, both of Jackson, Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Apr. 6, 1973, Ser. No. 348,590
Int. Cl.² B65B 57/14
U.S. Cl. 141—207 7 Claims



1. A tank filling system particularly suitable for filling tanks having an upper access opening comprising, in combination, a shutoff valve housing having an axis, an inlet port and an outlet port, liquid supply attachment means defined at said inlet port, an axially extending fluid passage defined in said housing communicating with said ports, an axially movable rod within said valve housing and passage and coaxial therewith, a valve element within said passage mounted on said rod and selectively movable with said rod between open and closed positions, an expansible motor having a movable piston within said valve housing, said expansible motor and piston being of an annular configuration concentrically disposed about said rod, a plurality of detents evenly spaced about said rod engageable with a circumferential groove defined therein, said detents being located intermediate said rod and said annular piston and selectively locking said rod and valve element in said open position, said piston operatively controlling said detents, aspirator means within said passage communicating with said motor tending to produce a vacuum within said motor during liquid flow through said passage, an atmospheric vent communicating with said motor permitting air to enter said motor and prevent movement of said piston while said vent is exposed to the atmosphere, upon said vent being submerged in liquid the substmospheric pressure within said chamber causing displacement of said piston releasing said detents from said rod causing said rod and element to move to said closed position, and manual reset means mounted on said valve housing movably shifting said rod and valve element from said closed position to said open position.

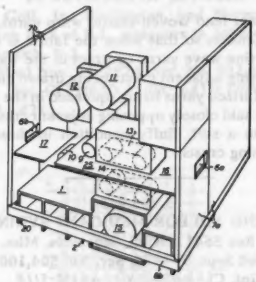
3,965,948

PLANING MACHINE

Torgny Folke Vilhelm Lundin, Partille, Sweden, assignor to Jonsereds Fabrikers Aktiebolag, Partille, Sweden

Filed Nov. 5, 1974, Ser. No. 521,193
Claims priority, application Sweden, Nov. 7, 1973, 7315102
Int. Cl.² B27C 9/04
U.S. Cl. 144—3 R 21 Claims

1. A wood working machine, particularly planing machine, including a frame and a plurality of machine components carried by the frame and assembled into a number of independent units, said machine comprising at least one working section including a motor-driven spindle for supporting a rotary wood working tool at a working position, a motor-driven feed mechanism for feeding work pieces through the machine, and adjustable guide means for guiding work pieces to and away from said working position and for keeping them engaged with a base during working, said components and said units assembled therefrom being removably mounted in a compact array, said wood working section comprising at least one independent detachable tool support unit composed of first and second subunits which are detachable from one another, wherein said first subunit is a spindle unit comprising a cylindrical spindle bearing housing and a spindle mounted in bearings in said housing, while said second subunit for axial adjustment of the spindle and consequently for setting of the tool along a first axis in relation to a movement of the work piece determined by said feed and guide mechanisms includes a support, a slide member guiding means and a first hollow slide member mounted in said guiding means and having a cylindrical chamber for receiving the spindle unit, said spindle unit being slidably insertable in and withdrawable from said chamber and being axially and radially lockable in a reference position in said chamber by releasable locking means, said



spindle unit forming said first subunit being axially movable and adjustable in said second subunit for permitting setting said tool along a first axis and said second subunit being arranged to be movably supported as a second slide member on a support connected to the frame to permit adjustment of the tool along a second axis at right angles to said first axis.

19. A wood working machine, particularly planing machine, including a frame and a plurality of machine components carried by the frame and assembled into a number of independent units, said machine comprising at least one working section including a motor-driven spindle for supporting a rotary wood working tool at a working position, a motor-driven feed mechanism for feeding work pieces through the machine, and adjustable guide means for guiding work pieces to and away from said working position and for keeping them engaged with a base during working, said components and said units assembled therefrom being removably mounted in a compact array, wherein at least one main portion of said frame has a box-like, sound attenuating construction including a plurality of parallel, open-ended cells which form an integral piece.

3,965,949

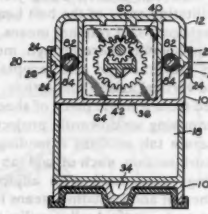
PENCIL SHARPENERS

Jack Ralph Aston, and Ronald Whitehouse, both of Dudley, England, assignors to Joseph Gillott & Sons Limited, Dudley, England

Filed Oct. 10, 1974, Ser. No. 513,644
Claims priority, application United Kingdom, Oct. 12, 1973, 47721/73
Int. Cl.² B43L 23/04
U.S. Cl. 144—28.71 1 Claim

1. In a pencil sharpener comprising a body provided with an aperture for receiving one end of a pencil to be sharpened, a cylindrical cutter mounted for rotation about its axis, said

cutter axis being offset from a second axis which is the axis of said aperture, means for rotating the cutter about its axis, and means for revolving the cutter in planetary fashion about the second axis, the improvement comprising two separate parts of said body which meet in at least one plane containing the said second axis, together with means for securing the said



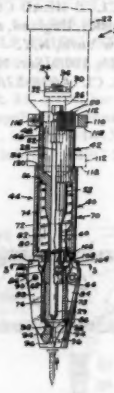
parts together, a gear pinion which is fast with the cutter, and an annulus gear fixed in the body, with which said gear pinion meshes to rotate the cutter during the planetary revolution of the cutter about the second axis, each of the two body parts being provided with a plurality of recesses, each of which is adapted to register with a complementary recess in the other body part to receive said annulus gear in a selected position.

3,965,950

FASTENER DRIVER AND FASTENER HOLDING NOSEPIECE

Murdo A. MacDonald, 600 Ridge Road, Bloomfield Hills, Mich. 48013

Filed Mar. 20, 1975, Ser. No. 560,360
Int. Cl.² B25B *15/00, 23/10*
U.S. Cl. 145—52 **35 Claims**



1. For a tool having a housing which supports a driver for movement along an axis for driving an article of the type having a head and a shank toward a work piece, an article holding nosepiece which comprises,

an adapter adapted to be mounted on the tool housing,

a body supported for movement between advanced and retracted positions relative to said adapter, such movement being generally parallel to the direction of article-driving movement of the driver,

means providing a bias which yieldably urges said body toward said advanced position,

a plurality of jaws supported on said body for movement lateral of said direction between closed condition for holding an article shank in alignment with the driver and open condition for releasing the article shank,

said adapter and body having means which cooperate to form blocking means effective in said advanced position to block movement of said jaws from said closed condition to said open condition,

said body being movable against said bias toward said retracted position responsive to force applied thereto counter to said direction,

said blocking means being effective to release said jaws for movement toward open condition responsive to attainment by said body of said retracted position,

said jaws, upon release thereof, being movable to said open condition under the impetus of an article head pushed thereagainst either in said direction or in said counter direction,

said body being returnable to said advanced position under said bias responsive to relief of said force,

said blocking means being operable to return said jaws to said closed condition responsive to return of said body to said advanced position.

3,965,951

SINGLE CHEMICAL ELECTRIC DETONATOR

Calvin L. Scott, Washington, D.C., and Howard S. Leopold, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 8, 1974, Ser. No. 522,077
Int. Cl.² C06B *41/00*
U.S. Cl. 149—23 **2 Claims**

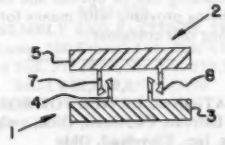
1. In an electrical explosive detonator including a container for an explosive charge, the improvement wherein the explosive charge consists solely of mercuric-5-nitrotetrazole.

3,965,952

PLASTIC SNAP FASTENER

Samuel J. Rivman, White Plains; Bernard Cohen, Spring Valley, and Alvaro Da Costa, Garnerville, all of N.Y., assignors to Eastern Poly Packaging Company, Brooklyn, N.Y.

Filed Nov. 13, 1972, Ser. No. 306,273
Int. Cl.² B65D *33/16*; A44B *7/00*
U.S. Cl. 150—3 **4 Claims**



1. A reclosable bag of a heat sealable material having a snap fastener unit comprising:

a. a bag with a flap having complementary apertures in the flap and in the bag body;

b. said unit having two separable fastener elements;

c. each of said elements having a base with a cylinder projecting upwardly therefrom;

d. each of the bases of said elements comprising:

1. a raised collar portion immediately adjacent the cylinder; and,

2. a peripheral flange portion;

e. the cylinder of the first element naving a horizontal rib on the upper portion of the inner surface thereof;

f. the cylinder of the second element having a horizontal rib on the upper portion of the outer surface thereof to cooperate with the rib of the first element to snap said elements together;

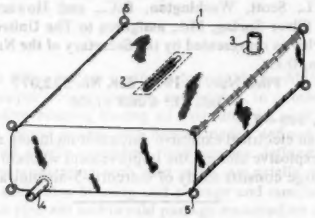
g. the element bases having a roughened upper surface;
h. the cylinder and collar of one of said elements projecting through an aperture in the flap of said bag to permit the upper surface of the flange portion of said base to be heat sealed to said flap;
i. the cylinder and collar of the other of said elements projecting through an aperture in the body of said bag to permit the upper surface of the flange portion of said base to be heat sealed to the body of said bag;
j. the flap element and the body element being positioned to permit closing and opening of said bag upon fastening and separating said elements thereby providing a reclosable bag.

3,965,953

FLEXIBLE CONTAINER FOR WINE AND FRUIT-JUICE

Theo Becker, Deidesheim; Eduard Hilscher, Idstein, Taunus, and Karl-Heinz Ott, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sept. 10, 1974, Ser. No. 504,701
Claims priority, application Germany, Sept. 12, 1973, 7332995[U]
Int. Cl.² B65D *89/08, 85/72, 33/06, 33/24*
U.S. Cl. 150—3 8 Claims



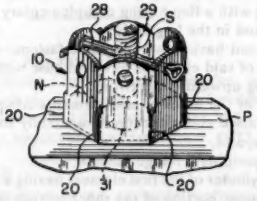
1. A flxible gas and liquidtight container for wine and/or fruit-juice, lined with a material resistent to wine and/or fruit-juice, having four sides, a top and a bottom forming four corners, a filling opening, an emptying opening and an opening big enough for cleaning the inside of the container, said cleaning opening having a gas and liquidtight zipper by which the cleaning opening can be opened and closed and each of said corners being provided with means for ease of handling and transporting said container.

3,965,954

ANTI-ROTATIONAL DEVICE FOR BOLTS AND NUTS

Raymond A. Lofredo, Cleveland, Ohio, assignor to Industrial Innovations, Inc., Cleveland, Ohio

Filed Feb. 19, 1975, Ser. No. 550,930
Int. Cl.² F16B *39/04, 39/282*
U.S. Cl. 151—5 4 Claims



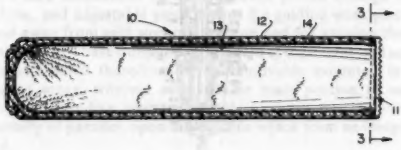
1. In combination an article of manufacture comprising a locking receptacle and a bolt or nut element said locking receptacle receiving the bolt head or nut element, said locking receptacle including a base having said bolt head or nut element seated thereon and a side wall portion extending upwardly from said base encompassing and extending beyond the associated bolt head or nut element, and retainer means extending inwardly from said side wall portion in overlying relation to said bolt head or nut element for preventing free movement of the bolt head or nut element out of said locking receptacle, said side wall portion being yieldable relative to said base for facilitating entry of the bolt head or nut element into said receptacle past said retainer means, said base having a generally central opening therethrough, means for aiding in restricting rotary movement of said receptacle on a support surface about the vertical axis of said article, and wherein said article is provided from a single piece of sheet metal, said side wall portion comprising an upwardly projecting unitary curb section and separate tab sections extending upwardly vertically from said curb section, each of said tab sections being in generally abutting relationship with adjacent tab sections along the sides thereof and including means readily permitting said tab sections to be individually resiliently yieldable in a generally radial direction toward and away from said axis for providing said ease of insertion of the associated bolt head or nut element past said retaining means, each of said tab sections having an opening therethrough for receiving a locking key, said retaining means comprising an embossment on the respective tab section circumscribing the respective opening through the tab section and extending inwardly into overlying relation to said bolt head or nut element, the bolt head or nut element being received in generally close fitting coaction with said side wall portion whereby the bolt head or nut can not be rotated about said axis without turning of said receptacle, the last mentioned opening comprising said rotary restricting means and being adapted to receive an anchoring member therethrough, such as for instance the aforementioned locking key.

3,965,955

GOLF CLUB HEAD COVERS

Edward John Price, Dunsley, England, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed May 21, 1975, Ser. No. 579,539
Int. Cl.² A63B *57/00*
U.S. Cl. 150—52 G 3 Claims



1. A golf club head cover comprising an elongated receptacle having an open end for receiving a golf club head, said receptacle being defined by at least a three ply wall including an outer layer of a material substantially impervious to water, an inner liner of a soft non-moisture absorbent textile material and an intermediate layer of a flexible foam plastic material, said inner liner and said intermediate layer being conjoined, said inner liner and said intermediate layer being free from attachment to said outer layer except at said open end.

3,965,956

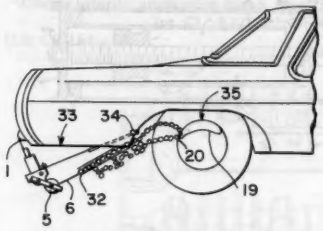
BUMPER MOUNTED SPRING DRIVEN TIRE INSTALLER AND REMOVER

Norman Whatley, Jr., Littleton, Colo., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Continuation of Ser. No. 428,849, Dec. 27, 1973, abandoned. This application June 17, 1975, Ser. No. 587,548

Int. Cl.[2] B60C 27/14

U.S. Cl. 152—214 7 Claims



1. A device for installing and removing tire chains from the wheels and tires of a vehicle, comprising

first clamp means for engaging a rear body portion of the vehicle,

tire chain means for engaging wrappingly around a tire of a vehicle for protecting it against skidding on roads, paths and pavements,

second magnetic clamp means for engaging a forward end of said tire chain means and constructed and arranged for being releasably secured to a traction supporting member of said vehicle,

elongated take-up belt means engaging at its forward end portion to said tire chain means at a rearward end portion thereof, and

roller assembly means engaging said take-up belt means and said first clamp means for rolling up said tire chain means about and upon said traction supporting member.

3,965,957

VEHICLE WHEEL STRUCTURE

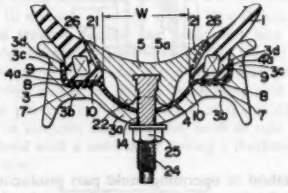
Eiji Nakasaki, Kakogawa, Japan, assignor to Sumitomo Rubber Industries, Ltd., Japan

Filed Sept. 25, 1974, Ser. No. 509,040

Claims priority, application Japan, Sept. 25, 1973, 48-111578[U]; Dec. 12, 1973, 48-144556[U]

Int. Cl.[3] B60C 5/04

U.S. Cl. 152—400 21 Claims



1. A vehicle wheel structure for use with a pneumatic tire, which comprises:

a hub, a rim, and a wheel axle, said hub being adapted to support the wheel structure therethrough on said wheel axle and said rim being adapted to support the pneumatic tire which is fitted therearound;

said rim having a pair of opposed rim flanges extending radially outwardly from respective sides of said rim, said pneumatic tire having a pair of opposed bead portions which substantially form respective side edges of said pneumatic tire, said bead portions, when said pneumatic tire is fitted around said rim, abutting against said respective rim flanges;

a flexible endless band held flat on said rim;

at least one rib and a corresponding mating groove formed in each of the side portions of said flexible endless band and each of the side portions of said rim adjacent said rim flanges, respectively, in the circumferential direction of said wheel structure, said rib, when said flexible endless band is held flat on said rim, being in engaging relationship with said mating groove, thereby avoiding any possible lateral displacement of said flexible endless band relative to said rim which may otherwise take place in a direction substantially perpendicular to the mid-circumferential plane of said tire; and

a plurality of bead stoppers adapted to be disposed on said rim and between said bead portions of said pneumatic tire in substantially equally spaced relationship in the circumferential direction of said wheel structure, each of said bead stoppers having one surface formed with a substantially crater-shaped projection adapted to contact a central portion of said rim between said side portions of said rim through said flexible endless band, and a pair of side portions extending laterally outwardly in opposite directions from the body of said bead stopper and adapted to contact said bead portions of said pneumatic tire, each of said bead stoppers including a set bolt having one end rigidly connected to said stopper, a substantially intermediate portion of said bolt extending in alignment with the center of said crater-shaped projection and the other end of said bolt being adapted to terminate outside said rim facing said hub, said crater-shaped projection and said side portions of each of said bead stoppers acting, when said bead stoppers are held in position on said rim and between said bead portions, in such a manner that said bolt extends through a perforation formed in said central portion of said rim, and is subsequently fastened with a corresponding nut with said rim and flexible endless band being firmly sandwiched between said nut and said crater-shaped projection, to firmly press said bead portions against said respective rim flanges, thereby causing said bead portions to substantially hermetically contact said respective rim flanges over the entire circumference of each of said bead portions and also to seal any clearance which may otherwise be formed between said bolt and said perforation in said rim.

3,965,958

JOINT ASSEMBLY AND FASTENER THEREFOR

Ernest Joseph Kump, 360 Everett Ave., Palo Alto, Calif. 94301

Filed Oct. 31, 1974, Ser. No. 519,572

Int. Cl.[2] F16B 5/00, 13/08

U.S. Cl. 52—753 K 11 Claims

1. A fastening assembly for members having adjacent edges with abutting faces and channels extending behind the abutting faces with opposed elongate openings through the abutting faces communicating with the channels and extending substantially parallel thereto, comprising

an elongate body having a thickness adapted to pass through the opposed elongate openings and a height for extending between the channels,

said elongate body being flexible about the long axis thereof,

and a plurality of axially spaced members attached to said elongate body extending laterally along both edges thereof and adapted to slidably fit into the channels for contacting the surface thereof adjacent said opposed elongate openings,

each of said plurality of axially spaced members having a rounded portion at each end thereof, so that the fastening assembly can be drawn through the channels without catching on the sides thereof.

3,965,959

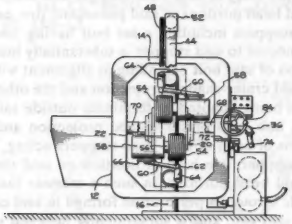
TIRE BUFFER

James D. Weir, 3863 Prospect No. 8, Culver City, Calif. 90230

Filed Sept. 9, 1974, Ser. No. 504,509

Int. Cl.² B29H *21/01*; B24B *5/00*

U.S. Cl. 157—13 **11 Claims**



1. A tire buffer for pneumatic tire casing to be retreaded which includes

a rotary tire support,

a pair of powered rotary rasps in one hemisphere of said support and at each side of a plane containing the rotational axis of said rotary support, the rotational axes of said rasps being parallel in their initial positions to the rotational axis of the support,

supporting means for each rasp, and means for moving said rasps into engagement with the tread of a tire casing on said support from initial position in engagement with the central peripheral portion of the tire to successive positions from the central peripheral portion in a direction transversely of the tread portion in opposite directions on a cross-sectional profile of the tire to the sidewall portions thereof.

3,965,960

RETRACTABLE SHOWER SHADE WITH ADJUSTABLE EXTENSIBILITY

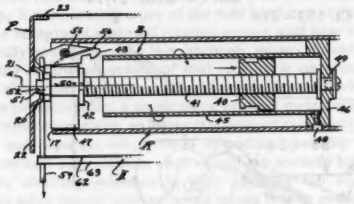
Peyton L. Massey, 12221 Wilshire Blvd., Los Angeles, Calif. 90025

Filed Sept. 16, 1974, Ser. No. 506,262

Int. Cl.² E06B *9/208*

U.S. Cl. 160—295 **10 Claims**

1. In combination with a retractile and extensible shade of flexible sheet reeled from a roller journaled upon spaced mounting plates, a revolvably adjustable retraction means fixedly anchored to the mounting plate at one end of the roller and biasing the roller to reel the sheet thereon, a revolvably adjustable extension limiting means fixedly anchored to the mounting plate at the other end of the roller and having a stop engageable with an element positioned by turning of the



roller, and a latch means releasably engaging the said element and holding it against said stop.

3,965,961

METHOD OF OPERATING AUTOMATIC MOLD PART PRODUCING APPARATUS

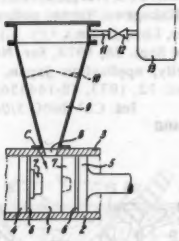
Marius Gunnergaard, Lyngby, Denmark, assignor to Dansk Industri Syndikat A/S, Herlev, Denmark

Division of Ser. No. 290,369, Sept. 19, 1972, Pat. No. 3,880,223. This application Dec. 6, 1974, Ser. No. 530,428

Claims priority, application Denmark, Sept. 23, 1971, 4651/71

Int. Cl.² B22C *15/28*

U.S. Cl. 164—40 **1 Claim**



1. A method of operating mold part producing apparatus including a horizontally disposed mold chamber having a pair of opposite end walls constituted by an axially reciprocal pressure plate and a counter pressure plate, and a mold part form supply bin disposed above said chamber and having communication therewith through an opening in the top of said chamber, said method comprising the steps of supplying material from said bin to said chamber, supplying air under pressure into said bin above said material to apply a vertical force to said material, and increasing the air pressure on said material in said bin toward the latter part of the filling operation to uniformly compact the material the full height of said chamber before compression thereof in the chamber by the pressure plate.

3,965,962

PROCESS FOR PRODUCING DUCTILE IRON CASTING

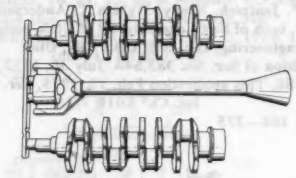
Toshiaki Tanaka, Kure; Shunsuke Yamaguchi, and Kazuharu Simowaki, both of Hiroshima, all of Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

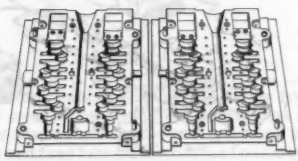
Continuation of Ser. No. 236,830, March 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 827,582, May 26, 1969, abandoned. This application Feb. 21, 1975, Ser. No. 551,883

Claims priority, application Japan, May 25, 1968, 43-35640

Int. Cl.² B22D *27/20*

U.S. Cl. 164—55 8 Claims





1. In a process for producing a ductile case iron crankshaft exhibiting the nodular graphite dispersed structure which comprises preparing a treated ductile cast iron melt, preparing a mold assembly having a bottom gating and set as a vertical pouring system, and pouring said treated ductile case iron melt into said mold assembly to produce a rigid cast iron crankshaft without chill formation on the crankshaft, the improvement which comprises

a. preparing said treating ductile case iron melt by subjecting a cast iron melt to graphite spheroidizing, and inoculating with up to 0.6% by weight of silicon to adjust the composition of the case iron melt to contain carbon in an amount of from 3.5 to 3.9%, and silicon in an amount from 2.3 to 2.9%, the combined carbon and ⅓ silicon content being within the range of 4.9 to 5.2%, and

b. within 10 minutes after the silicon inoculation, introducing said treated ductile cast iron melt into said mold assembly comprising a set of metal dies free of blind riser portions at the upper end of the crank shaft portions and comprising means for fixedly assembling said metal dies so as to prevent the deformation of the mold assembly during its eutectic solidification, each of said metal dies being lined with a sand layer having a thickness of more than 3 mm.

3,965,963

MOLD AND PROCESS FOR CASTING HIGH TEMPERATURE ALLOYS

Charles M. Phipps, Ridgewood, N.J., and Douglas R. Hayes, Vernon, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 416,563, Nov. 16, 1973, abandoned. This application May 2, 1975, Ser. No. 574,122

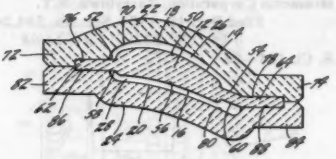
Int. Cl.² B22C *9/24*; B22D *25/06*

U.S. Cl. 164—60 12 Claims

6. In the manufacture of a cast hollow turbine blade, the steps of:

forming a central mold element of a strong refractory oxide material of such strength and thickness as to retain its shape without distortion during mold heating, pouring and cooling, said element having a configuration on each side corresponding to the configuration of the inner surfaces of the hollow blade and having projecting flanges at opposite edges extending beyond the blade configuration;

forming opposed outer mold elements of a refractory oxide to be positioned on opposite sides of the central element, one of said outer elements having an inner surface corresponding to the convex side of the blade and the other outer element having an inner surface corresponding to the concave side of the blade, said outer elements having



side flanges projecting beyond the shaped inner surface thereon to engage with the flanges on the central element and thereby space the formed inner surfaces of the outer elements from the configurations on the central element to establish the desired wall thickness of the blade;

assembling the several mold elements to produce a cavity for a blade half on each side of the central element, the latter providing adequate strength to prevent distortion of the entire mold;

filling the mold cavities with molten alloy;

removing the cast blade halves from the mold when the alloy is solidified; and

assembling the cast blade halves to form a complete blade.

3,965,964

METHOD OF CONTINUOUSLY CASTING STEEL STRANDS, IN PARTICULAR SLABS

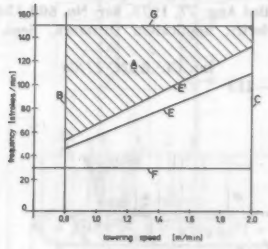
Thorwald Fastner, and Manfred Pammer, both of Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 2, 1975, Ser. No. 538,140

Claims priority, application Austria, Jan. 11, 1974, 206/74

Int. Cl.² B22D *11/04*

U.S. Cl. 164—83 11 Claims



1. A method of continuously casting a steel strand, for example a slab, in a continuous casting plant, wherein the strand which has a certain temperature is withdrawn from a cooled oscillating mold and is lowered at a certain lowering speed, said mold oscillating at a certain oscillation frequency, whereby oscillation marks distributed at certain distances over the strand surface are formed, and wherein the strand is fur-

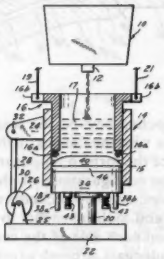
ther cooled in a secondary cooling zone arranged to follow the mold, the improvement comprising the step of coordinating the oscillation frequency of the mold and the lowering speed of the strand with each other so that the oscillation marks occur only within a certain maximum distance from each other, the distance of the oscillation marks being defined as the quotient of the lowering speed in meters per minute to the mold frequency in strokes per minute and amounting to maximumly 0.018 meters.

3,965,965

METHOD AND APPARATUS FOR CONTINUOUS CASTING OF METAL TUBING

Leonard Watts, Cedarhurst, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Dec. 19, 1974, Ser. No. 534,244
Int. Cl.² B22D *11/04*, *11/08*
U.S. Cl. 164—83 **16 Claims**



1. A method of casting an elongated hollow article utilizing a vertically arranged mold having an oscillatable chilled axial wall structure, comprising:

pouring molten metal by gravity from a source directly into one end of the mold;

relatively separating a starting bar from the mold which starting bar has at least an open end portion immersed in the metal, to withdraw the solidified article adhering to said bar from said end of said mold, during oscillation of the axial wall structure of said mold: and

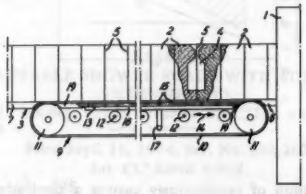
supplying the molten metal for such article from said mold.

3,965,966

APPARATUS FOR THE PRODUCTION OF CASTINGS

Marius Gunnergaard, Lyngby, Denmark, assignor to Dansk Industri Syndikat A/S, Herlev, Denmark

Filed Aug. 27, 1975, Ser. No. 608,334
Claims priority, application Denmark, Sept. 11, 1974, 4796/74
Int. Cl.² B22C *11/08*
U.S. Cl. 164—213 **4 Claims**



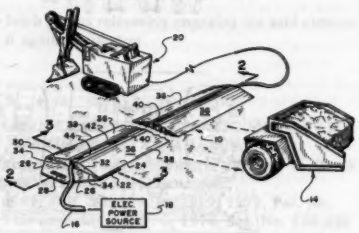
1. An apparatus for the production of castings, comprising a device for the successive production of identical mould parts and of a pouring track or guideway on which the mould parts are stacked together for the formation of a casting mould having at least one pouring cavity at each joint, said guideway over at least part of its length including a driving element which is reciprocable in the longitudinal direction of the guideway and solely during its forward stroke or part of this stroke is in driving connection with the casting mould, wherein the driving element is a plate which is reciprocable in its own plane and presents a number of apertures, through which compressed air can periodically be supplied to the top of the plate for eliminating the driving connection between the plate and the casting mould.

3,965,967

HIGH STRENGTH PORTABLE CABLE CROSSOVER FOR HIGH TONNAGE EARTH MOVING VEHICLES

David P. Jentzsch, Sandy; Hyrum T. Anderson, and Lee J. Olsen, both of Salt Lake City, all of Utah, assignors to Rubber Engineering, Inc., Salt Lake City, Utah

Division of Ser. No. 383,644, July 30, 1973, Pat. No. 3,888,186. This application Feb. 12, 1975, Ser. No. 549,234
Int. Cl.² E01B *7/28*
U.S. Cl. 104—275 **1 Claim**



1. A combination comprising:

an electrically powered excavator;

a ground-engaging portable cable crossover for out-of-doors use with heavy load earth moving vehicles weighing many tons when loaded comprising:

a unitary one piece body of molded synthetic resinous material having a durometer hardness sufficient to support excavating vehicle loads of many tons;

said body comprising:

feathered front and back edges, each edge being defined by said material disposed in the form of an acute angle tip;

front and back tapered ramps, respectively extending from the tip of each edge toward the center of the body and defining a horizontal flat continuous load bearing bottom surface, and angular top surface which diverges from the bottom surface in an inward direction and a solid interior between said bottom and top surfaces;

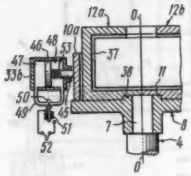
a central solid portion comprising said one piece body so as to be integral with each tapered ramp and bridging therebetween having a width substantially less than the width of either ramp, the center portion comprising a central horizontal flat continuous load bearing bottom surface linearly connecting the two ramp bottom surfaces one to the other thereby creating a continuous horizontal load bearing crossover bottom surface and spaced top shoulders respectively angularly joined to the angular top ramp surfaces and a U-shaped recess the surface of which connects one top shoulder to the other, the U-shaped recess running the full length of the crossover for receiving an electrical cable at the bottom thereof, said recess having a vertical depth substantially greater than the diameter of the cable, the spaced top shoulder and the solid material thereunder withstanding the load of high tonnage ground-engaging vehicles when displaced across the crossover without deflection or destruction of said shoulders such as would impose vehicle load on the cable in the recess.

3,965,968

DEVICE FOR CENTRIFUGAL CASTING OF HOLLOW BODY WITH ASYMMETRICAL CROSS-SECTION

Nikolai Nikitievich Alexandrov, Sharikopodshipnikovskaya ulitsa, 2, kv. 126; Nikolai Nikolaevich Zorev, ulitsa Novinki, 6, kv.; Viktor Mikhailovich Krapukhin, Suvorovsky bulvar, 15, kv. 13; Viktor Vasilievich Krotov, Obolensky pereulok, 7, kv. 110; Ivan Romanovich Kryanin, Sharikopodshipnikovskaya ulitsa, 2, kv. 68; Boris Samoilovich Milman, Sharikopodshipnikovskaya ulitsa, 2, kv. 89; Pavel Vladimirovich Semenov, Nagatinskaya ulitsa, 95, kv. 62; Nikolai Anatolievich Sokolov, Sharikopodshipnikovskaya ulitsa, 2, kv. 160, and Viktor Gurievich Tinyakov, Juzhno-Portovaya ulitsa, 16, kv. 23, all of Moscow, U.S.S.R.

Filed Dec. 24, 1974, Ser. No. 536,310
Claims priority, application U.S.S.R., Jan. 2, 1974, 1981019
Int. Cl.² B22D *13/04*
U.S. Cl. 164—287 1 Claim



1. A device for centrifugal casting of a hollow body with asymmetrical cross-section comprising a fixed base plate; a revolving disc adapted to have constant speed and mounted revolvably on said fixed base plate; a rod fixed on a stay so that it is disposed radially to the spinning axis of said revolving disc; a piston carried by said rod; a cylinder filled with fluid and accommodating said piston; said cylinder having spaces separated by said piston but in communication with one another along a by-pass line; said cylinder acting as a counterbalance weight traveling under the effect of centrifugal forces when a throttle on said by-pass line opens so as to facilitate movement of fluid and cylinder to and away from the spinning axis; a metal mould provided with lining and set up on said revolvable disc so that the longitudinal axis of this mould is essentially coaxial with the spinning axis of said revolvable disc; a cavity in said metal mould causing a progressing unbalance of the device as the cavity becomes filled with molten metal; said throttle adapted to open at the moment said cavity in said metal mould is being filled with said molten metal causing said unbalance; and electric motor means for rotating said revolvable disc.

3,965,969

CONVERTIBLE FOOD SERVICE CART

Joseph R. Williamson, 613 W. Cheltenham Ave., Philadelphia, Pa. 19126

Filed June 11, 1973, Ser. No. 368,712
Int. Cl.² F25B *29/00*; A47B *77/08*
U.S. Cl. 165—12 4 Claims

1. In a convertible food service cart suitable for storing food in a refrigerated condition in a container placed upon a tray and for heating at least part of the food, the combination of

A. a first compartment defining an interior space,

1. said first compartment including first means to refrigerate the food within the first compartment by lowering the temperature within the interior space,

2. said first compartment also including second means to heat the food within the first compartment,

a. said second means including a plurality of hot food conversion trays,

1. at least some of the conversion trays including a heating element and a connected electrical plug receptacle,

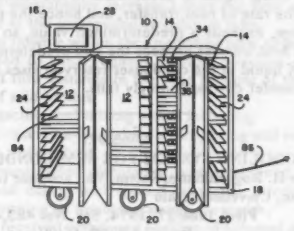
2. said conversion trays receiving a plurality of food containing dishes thereon for heating purposes,

b. the second means further including a plurality of electrical plugs communicating with the interior of the first compartment,

1. the receptacle of said conversion trays being electrically interconnected with one said electrical plug to electrically energize the heating element,

2. said heating element heating the food within the container but not heating the interior space; and

B. program means to time the cycle of operation of the first means and the second means,



1. said program means including a timer and a time delay relay, the said time delay relay functioning after activation of the second means to prevent function of the first means for a predetermined time delay period,

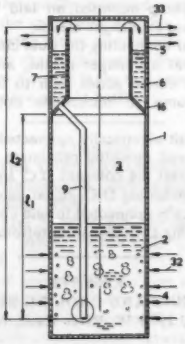
2. the program means further includes carryover means, the said carryover means functioning the timer during periods when the cart is being moved whereby the timer can continue to program the operation of the first and second means even though the cart is disconnected from a source of power.

3,965,970

CONTROL OF TWO-PHASE THERMOSYPHONS

Duncan Chisholm, Strathaven, Scotland, assignor to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Nothern Ireland, London, England

Filed Oct. 10, 1974, Ser. No. 513,744
Claims priority, application United Kingdom, Oct. 11, 1973, 47498/73
Int. Cl.² F28D *15/00*
U.S. Cl. 165—32 1 Claim



1. A two-phase thermosyphon comprising a closed vessel of tubular form containing a liquid in contact with its vapour and having: a lower end at which is located an evaporator where heat may be absorbed by vaporisation of liquid; an upper end

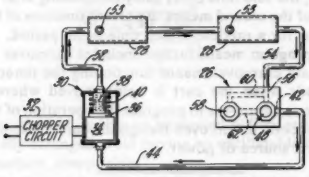
at which is located a condenser where heat may be given up by condensation of vapour; a cylindrical baffle located at the upper end of the vessel, and sealed to the vessel wall through which vapour may rise from the evaporator; a condenser reservoir of annular cross-section located adjacent the condenser having an inner surface defined by the baffle and an outer surface which forms part of the condenser whereby heat may be transferred from a heat source adjacent the evaporator to a heat sink adjacent the condenser at a rate dependent on the level of liquid in the condenser reservoir; and a connecting tube for limiting the said rate of heat transfer, said tube interconnecting the lower end of the condenser reservoir and the evaporator and being provided with a constriction at its lower end to cause liquid to accumulate in the condenser reservoir when the rate of heat transfer, and hence the rate of condensate flow, exceeds a predetermined value, so that when the rate of heat transfer exceeds the said predetermined value the level of liquid in the condenser reservoir rises and the rate of heat transfer correspondingly falls.

3,965,971

COOLING SYSTEM FOR SEMICONDUCTORS

George H. Roggenkamp, Salem, Va., assignor to Eaton Corporation, Cleveland, Ohio

Filed June 27, 1974, Ser. No. 483,489
Int. Cl.² F28D *15/00*
U.S. Cl. 165—39 **6 Claims**



1. In a battery powered vehicle:
a heat sink mounted on said vehicle;
a power semiconductor utilized to vary the speed of the vehicle mounted on said heat sink, said heat sink having a cavity formed therein to mount said power semiconductor, and forming a fluid chamber for maintaining cooling fluid in heat transfer communication with said semiconductor;
heat exchanger means mounted on said vehicle for dissipating heat to the ambient;
an oscillating pump mounted on said vehicle at a level below said heat exchanger means;
tubing means for connecting the fluid chamber of said heat sink, said heat exchanger means, and said oscillating pump into a closed series path to thereby allow said oscillating pump to recirculate cooling fluid therethrough; and
a chopper circuit electrically connected to the battery of said vehicle and mounted proximate to said oscillating pump to convert the constant D.C. signal of the vehicle battery to a pulsating D.C. signal, said oscillating pump being electrically connected to said chopper to be driven by the pulsating D.C. signal therefrom.

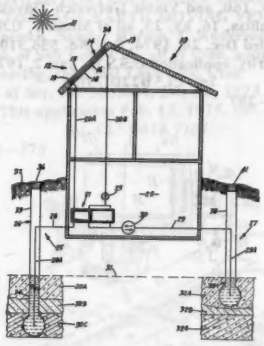
3,965,972

HEATING AND COOLING SYSTEM

Ross K. Petersen, 2974 W. River Road, Minneapolis, Minn. 55406

Filed Nov. 4, 1974, Ser. No. 520,270
Int. Cl.² F28D *7/00*
U.S. Cl. 165—45 **27 Claims**

1. A heat transfer system comprising: solar energy collector means having a first fluid to transfer heat energy, heat exchange apparatus receiving the first fluid from the collector means, an underground heat storage well, an underground cold storage well, first piping means connecting said solar collector means and heat exchange apparatus for conveyance of the first fluid between said collector means and heat exchange apparatus, second piping means connecting the heat storage well, cold storage well and heat exchange apparatus



for conveyance of a second fluid between said wells and heat exchange apparatus, first pump means to circulate the first fluid in the first piping means between the solar energy means and heat exchange apparatus, and second pump means operable to circulate the second fluid in said piping means whereby heat energy in the first fluid is transferred to the second fluid, said heated second fluid being stored in the heat storage well.

3,965,973

TEMPERATURE SENSING DEVICE

Raghulinga R. Thettu, Webster, N.Y., and Xerox Corporation, 02, Stamford, Conn., assignors to Xerox Corporation, Stamford, Conn.

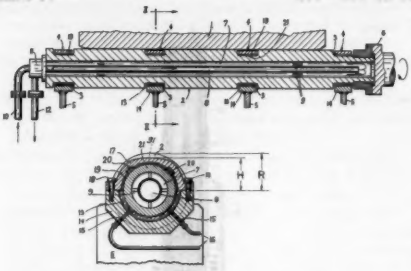
Division of Ser. No. 388,676, Aug. 15, 1973, Pat. No. 3,888,622. This application Nov. 13, 1974, Ser. No. 523,614
Int. Cl.² F28D *11/02*
U.S. Cl. 165—86 **6 Claims**

1. Apparatus for providing improved heat transfer between two bodies including
a first moving body
a second stationary body positioned adjacent to said first body in non-contiguous relation therewith so as to form an air gap therebetween,
magnetic means for establishing a flux field within said air gap, and
a magnetic medium having a high coefficient of thermal conductivity filling said air gap within the flux field whereby heat energy rapidly and efficiently flows between said bodies.

3,965,974
CONTINUOUS CASTING PLANT

Heinz Sernetz; Othmar Pühringer, and Rudolf Hoscher, all of Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 20, 1975, Ser. No. 542,682
Claims priority, application Austria, Jan. 21, 1974, 460/74; Dec. 23, 1974, 10268/74
Int. Cl.² F28D *11/02*; F28F *5/02*; F27D *3/00*
U.S. Cl. 165—89 30 Claims



1. A roller or roll assembly for supporting, guiding, bending, straightening or deforming a continuously cast strand of relatively great width, for example a steel slab, in a continuous casting plant having a supporting structure, said roller or roll assembly comprising:

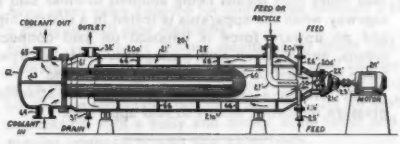
a roller or roll having a small diameter and a great longitudinal extension exceeding the width of the continuously cast strand, annular recesses being distributed over the longitudinal extension of the roller or roll to form relatively narrow bearing pins of substantially cylindrical shape; and

bearings surrounding and accommodating said bearing pins, said bearings having a height, measured from their center in the direction toward the strand, that is smaller than the radius of the roller or roll, said bearings being supported against the supporting structure of the continuous casting plant.

3,965,975
BAFFLING ARRANGEMENTS FOR CONTACTORS

Charles W. Edmundson, Leawood, Kans., assignor to Stratford Engineering Corporation, Kansas City, Mo.

Filed Aug. 21, 1974, Ser. No. 499,152
Int. Cl.² F28F *13/12*; B01F *5/10*
U.S. Cl. 165—108 12 Claims



1. In a contacting and mixing vessel including:

an elongate casing having a discharge opening and inlets for the fluids to be mixed,

a hollow open-ended circulating tube positioned axially within said casing and spaced from the interior wall thereof forming an annular passage therewith,

an impeller received within and positioned adjacent one end of the circulating tube for mixing and creating a cyclic flow of fluids through said tube and in the annular space surrounding said tube, and

a circulating head forming the end of the casing adjacent the impeller,

the improvement which comprises:

the circulating tube closely spaced adjacent to the interior wall of the casing whereby the annular space therebetween is minimal thereby to produce a high velocity of fluids flowing therethrough and

a plurality of baffles positioned interiorly of said circulating tube, spaced along the length thereof and extending at substantial right angles to the longitudinal axis of said tube,

said baffles of sufficient number and such configuration that the flow velocity of the fluids within the circulating tube is substantially increased over the flow velocity thereof in the unimpeded circulation tube,

said fluids flowing within the circulating tube additionally subjected to shear, change of flow direction and increased flow distance in the tube because of the presence of said baffles.

3. In a contacting and mixing vessel including:

an elongate casing having a discharge opening and inlets for the fluids to be mixed,

a hollow, open-ended circulating tube positioned axially within said casing and spaced from the interior wall thereof forming an annular passage therewith,

an impeller received within and positioned adjacent one end of the circulating tube for mixing and creating a cyclic flow of fluids through said tube and in the annular space surrounding said tube,

a circulating head forming the end of the casing adjacent the impeller and,

heat exchange means penetrating the other end wall of the casing and extending into the other end of said circulating tube,

said heat exchanging means extending substantially the length of said circulating tube and of an outer diameter substantially that of the inner diameter of the tube,

the improvement which comprises:

the circulating tube spaced a substantial distance away from said casing interior wall whereby the annular space therebetween is of considerable volume thereby to ordinarily produce a relatively low velocity of fluid flow therethrough, and

a plurality of baffles positioned interiorly of the annular space between said casing and circulating tube and spaced along the length thereof, same extending at substantial right angles to the longitudinal axis of the casing,

said baffles of sufficient number and such configuration that the flow velocity of the fluids within the annular space is substantially increased over the flow velocity thereof in the unimpeded annulus,

said fluids flowing within said annular space additionally subjected to shear, change of flow direction and increased flow distance in the said annular space because of the presence of said baffles.

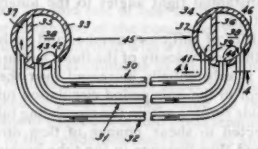
3,965,976
HEATER TUBE ARRANGEMENTS

David W. Barton, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 3, 1974, Ser. No. 466,653
Int. Cl.² F28F *9/02*
U.S. Cl. 165—175 8 Claims

1. A heater head assembly of the type useful in a hot gas engine of the Stirling type wherein a labyrinth of heat conductive tubes provide a closed connection for trapped gas at high pressure to reversibly communicate between a high temperature working chamber and a thermal regenerator, said labyrinth of heat conductive tubes selectively receiving heat from a central gaseous heat source within said labyrinth of tubes and promoting absorption of heat from said source to the trapped gas therein which is at a relatively lower temperature equal to or greater than 600°F, the assembly comprising:

a. a first header connected to at least one high temperature working chamber,
b. a second header connected to at least one thermal regenerator,
c. a continuous passage labyrinth having inner and outer cylindrical walls, an entrance communicating with one of said first and second headers and an exit communicating



with the other of said first and second headers, said labyrinth being characterized by at least one element associated with each header to revert gas communication after having traveled substantially the distance separating said first and second headers, whereby flow of said gaseous heat source through said labyrinth will conduct heat to an increased inner wall area for improving heat transfer to the high pressure trapped gas therein.

3,965,977

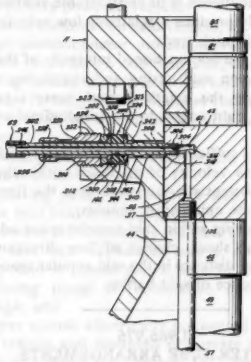
CONTROL LINE EXITING COUPLING

John Beson, Houston, Tex., assignor to McEvoy Oilfield Equipment Co., Houston, Tex.

Continuation of Ser. No. 352,677, April 19, 1973, abandoned, and a continuation-in-part of Ser. No. 218,916, Jan. 19, 1972, Pat. No. 3,739,846. This application Aug. 26, 1974, Ser. No. 500,750

Int. Cl.² E21B *33/03*

U.S. Cl. 166—88 **9 Claims**



1. Means for providing flow communication through a first member with a contiguous second member having a passage therethrough comprising:
an enlarged bore through said first member;
a flexible tubular connector for insertion into the bore of the first member, said connector having an outside diameter substantially less than said enlarged bore;
said connector positionable within the first member in a plurality of angular positions;
connection means for connecting said connector to the second member adjacent the passage; and
securement means sealing said connector within the bore of the first member; said securement means being located at a distance from said connection means to permit said connector to flex within the bore between the securement means and the connection means.

3,965,978

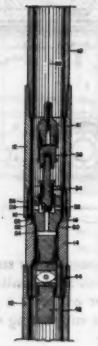
SUBSURFACE TRANSIENT PRESSURE TESTING APPARATUS AND METHOD OF USE THEREOF

Dell Conley; Howard H. Ferrell, and Jaime A. Lescarboura, all of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 485,688, July 2, 1974, abandoned. This application Nov. 6, 1974, Ser. No. 521,323

Int. Cl.² E21B *47/022, 47/10, 33/12*

U.S. Cl. 166—113 **11 Claims**



1. Apparatus for seating in a seating nipple in a well tubing string for use in temporarily shutting off fluid flow through the tubing at a subsurface location in a well and making pressure determinations below the plug comprising:
a. a main plug body having a passageway therethrough, said passageway providing fluid communication from the tubing below the seating nipple to the tubing above the seating nipple, said main plug body having a downwardly-facing shoulder area around the exterior thereof adapted to seat against an upwardly-facing shoulder area of a seating nipple and form a fluid impermeable seal therewith;
b. relief plug means carried by said main plug body and biased to close said passageway therein;
c. a relief plug port extending through the relief plug means to provide fluid communication between the passageway and the upper portion of the relief plug means;
d. connecting means attached to said relief plug means for connecting said apparatus to cable means for lowering and raising said apparatus through the well tubing string;
e. said relief plug means being adapted to close said passageway when the apparatus is seated in a seating nipple and no upward force is imposed on said connecting means, and to open said passageway when an upward force is applied to said connecting means, and
f. means forming a part of said apparatus for attaching a pressure indicating means to said apparatus.

3,965,979

ORIENTING SYSTEM FOR A KICKOVER TOOL

C. Paul Lamb, Garland, Tex., assignor to Teledyne, Inc., Garland, Tex.

Filed Feb. 12, 1975, Ser. No. 549,168

Int. Cl.² E21B *7/06*

U.S. Cl. 166—117.5 **14 Claims**

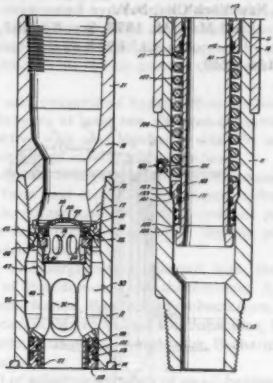
5. A kickover tool for running and retrieving well equipment comprising:
an elongate housing,

a plunger slidably carried within said housing,
a tool carrier pivotally carried by one of said housing and said plunger,
a retractable locator key pivotally carried by the other of said housing and said plunger,
means for resiliently urging the projection of said key outward from said housing,
an upwardly directed abutment shoulder on said key for engaging a downwardly directed stop shoulder in the well tubing in which the tool is run to articulate the tool,
a downwardly directed chamfered surface on said key to permit the key to ride over obstructions as the tool is lowered through the well tubing,

a downwardly directed stop shoulder on said key spaced inwardly from said chamfered surface for engaging orienting means located in the well tubing,
means for articulating said tool carrier with respect to said housing upon engagement of said abutment shoulder with a downwardly stop shoulder in the well,
means carried by said tool carrier for releasably securing thereto the well equipment to be run or retrieved, and
means rendering said upwardly directed abutment shoulder ineffective in response to a selected force to permit upward movement of the tool past stop shoulders in the well tubing.

3,965,980
MUD SAVER VALVE
Joseph Stephen Williamson, Houston, Tex., assignor to Smith International, Inc., Houston, Tex.
Filed Feb. 21, 1975, Ser. No. 551,897
Int. Cl.[2] E21B *7/00;* **F16K** *3/02*
U.S. Cl. 166—224 R **28 Claims**

1. Mud saver valve adapted for connection between a kelly and a string of drill pipe including
a tubular valve body having means at its lower end for making connection with a string of drill pipe and means at its upper end for making connection with a top sub,
a tubular top sub having means at its upper end for making connection with a kelly and means at its lower end for making connection with said valve body,
said top tub having a downwardly facing valve seat,
closure means adapted to engage said valve seat and including a stem extending downwardly from said valve seat,
said stem having a downwardly facing shoulder thereon,
upper seal means bearing against said downwardly facing shoulder and sealingly engaging said stem and said valve body,
spring support means including an upwardly facing shoulder in said valve body,
a chamber formed by said valve stem, valve body, support means and upper seal means,
spring means disposed in said chamber around said stem bearing at its lower end against said support means and biasing said closure means toward the closed position, distinguished by



said spring means bearing at its upper end against said upper seal means,
said upper seal means being held in position against said downwardly facing shoulder by said spring means that biases the closure means toward closed position.

3,965,981
PRE-PACKED WELL POINTS
Anthony J. D'Amiano, 5881 SW. 8th St., Plantation, Fla. 33314
Continuation-in-part of Ser. No. 509,241, Sept. 25, 1974. This application Apr. 3, 1975, Ser. No. 564,687
Int. Cl.[2] E03B *3/18;* **E21B** *43/08*
U.S. Cl. 166—228 **7 Claims**

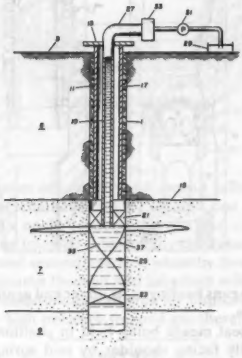
1. A prepacked well point comprising an inner perforated tubular member closed at its bottom end,
a tubular screen, perforated along its entire length, coaxial with and spaced around said inner tubular member and defining an annular space about said inner tubular member,
a filter medium filling said annular space,
said inner tubular member being perforated only near the closed bottom end thereof,
a vacuum coupling means, said coupling means being connected to the top end of said inner tubular member for coupling the prepacked well point to a vacuum line, and
a bottom plate, said bottom plate being imperforate and closing the bottom end of said inner tubular member, said annular space, and the bottom end of said tubular screen.

3,965,982

HYDRAULIC FRACTURING METHOD FOR CREATING HORIZONTAL FRACTURES

William L. Medlin, Dallas, Tex., assignor to Mobil Oil Corporation, New York City, N.Y.

Filed Mar. 31, 1975, Ser. No. 563,886
Int. Cl.[2] E21B 43/26
U.S. Cl. 166—249 **5 Claims**



1. A method of forming a horizontally disposed fracture in a subterranean formation that is penetrated by a borehole, comprisiing the steps of:

a. setting in said borehole against said formation an upper packer and a lower packer to form with each of said upper packer and lower packer a packer-to-formation bond with the wall of said formation and define with said borehole and intermediate said upper packer and said lower packer a fracture treatment zone;

b. applying hydraulic pressure to said fracture treatment zone in an amount slightly less than that pressure required to create a vertical fracture in said formation;

c. applying acoustical energy in said fracture treatment zone at a frequency to form a resonant condition therein and rigidly couple said upper packer and said lower packer with the wall of said formation and form a horizontal fracture in said formation; and

d. propagating said horizontal fracture into said formation by continuing to apply hydraulic pressure to said fracture treatment zone.

3,965,983

SONIC FLUID LEVEL CONTROL APPARATUS

Billy Ray Watson, Box 756, Monahans, Tex. 79756

Filed Dec. 13, 1974, Ser. No. 532,502
Int. Cl.[2] E21B 47/00
U.S. Cl. 166—250 **10 Claims**

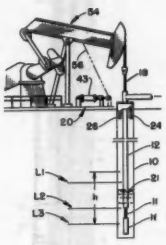
1. The combination with production apparatus associated with a wellbore and provided with a prime mover connected to actuate a pump, of a pump-off control apparatus comprising: a controller means connected to said prime mover for starting and stopping the pumping action; compressor means, a gas storage vessel connected to receive compressed gas from said compressor means, means by which said compressor means is connected to be actuated when said prime mover is energized;

a sound detector mounted at the upper extremity of the wellbore, a gas powered sound producing means focused down the wellbore to strike any downhole liquid surface and rebound back up the wellbore where it can be received by said sound detector;

a valve means connecting said sound producing means to said vessel, means including said controller means for de-energizing said prime mover and thereafter opening said valve means when the pressure differential between said vessel and said wellbore attains a magnitude which will produce said sound wave;

means, including a time delay means, for measuring the time interval required for a sound wave generated by said sound producing means to travel from the liquid surface uphole to the sound detector;

said time delay means only allows the sound detector to pass on a signal which occurs a finite time interval after said valve is opened, thereby avoiding any extremely large initial sound impulse being received by the sound detector;



means by which the prime mover is de-energized for a first time delay period when said time interval required for the sound wave to reach the sound detector is of a first value, means by which the prime mover is de-energized for a longer time delay period when said time interval required for the sound wave to reach the sound detector is of a second value; the last said time interval being indicative of a lower fluid level than the first said time interval.

6. Method of cyclically producing a fluid producing strata of wellbore wherein an artificial lift device is located downhole at a location which is usually below the fluid level thereof when the well is shut in, comprising the following steps:

1. starting said device and producing the well while simultaneously compressing a gas within a vessel;
2. stopping the device when the relative gas pressure differential measured between the vessel and the upper borehole annulus reaches a first value;
3. actuating a sound producing device with the gaseous contents of the vessel; and,
4. directing the sound wave downhole so that it must strike and rebound from any liquid level produced therein by the fluid producing strata;
5. detecting the rebound sound wave as it travels uphole through the borehole;
6. measuring the lapsed time required for the wave to travel from the location of the liquid level to the detecting location;
7. carrying out step (6) by measuring the sound wave detected in step (5) only during a time interval following a time delay wherein the time delay eliminates the measurement of any undesirable initial large sound impulse;
8. continuing the shut-in condition of the well for a first time interval when the lapsed time of step (6) is of a first value indicative of a pump-off condition;
9. starting the device when the lapsed time of step (6) is of a second value indicative of the presence of a hydrostatic head in the well which is of a value which will supply production fluid during the time required to carry out step (1).

3,965,984

WATERFLOOD METHOD USING OVERBASED NORMAL ALKYLAROMATIC SULFONATES

Charles R. Clark; M. Duane Gregory; Oliver C. Kerfoot, all of Ponca City, Okla.; Delmar D. Krehbiel, Lubbock, Tex., and Carl D. Kennedy, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 344,017, March 22, 1973, abandoned. This application Sept. 30, 1974, Ser. No. 510,204

Int. Cl.[2] E21B *43/22*

U.S. Cl. 166—270 14 Claims

1. A process for recovering hydrocarbons from a petroliferous formation which comprises:

d. injecting into the formation an effective amount of an aqueous mixture which contains about 0.5 to about 25 weight percent of an overbased waterflood additive;

the waterflood additive comprising a base component plus a normal alkylaromatic sulfonate;

wherein the waterflood additive is sufficiently overbased that the ratio: weight of excess base component/weight of sulfonate is about 0.20 to about 1.0;

wherein the base component is sodium hydroxide; and

wherein the normal alkylaromatic sulfonate is a sulfonate having been prepared by partially chlorinating a normal alkane having about 10 to about 18 carbon atoms to about 2 to about 15 weight percent chlorine content, employing the chlorinated alkane to alkylate to aromatic hydrocarbon, sulfonating the thus formed alkylate to form a sulfonic acid, and converting the sulfonic acid to a sulfonate by reacting with the base component; and

e. recovering the displaced hydrocarbons from the formation.

3,965,985

MICROBIAL SYNTHESIS FROM ALDEHYDE CONTAINING HYDROCARBON DERIVED PRODUCTS

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 366,563, June 4, 1973, Pat. No. 3,856,774, which is a continuation of Ser. No. 167,177, July 29, 1971, abandoned, which is a division of Ser. No. 751,926, Aug. 12, 1968, Pat. No. 3,642,578. This application Oct. 18, 1974, Ser. No. 515,873

Int. Cl.[3] E21B *43/16*

U.S. Cl. 166—275 15 Claims

1. A method of water flooding which comprises diluting a polymeric gum possessing water viscosifying properties with water or brine to a suitable viscosity and injecting the resulting diluted polymeric gum into oil-bearing strata,

wherein said polymeric gum is characterized as produced by process of microbiosynthesis as cellular production products from oxygenated hydrocarbon feedstock containing aldehydes in addition to other oxygenated hydrocarbons, which feedstock is characterized as formed by the oxidation of hydrocarbons, which process comprises the steps of:

a. adding to said oxygenated hydrocarbon feedstock containing aldehydes at least one nitrogen-containing compound reactive with said aldehydes whereby said aldehydes are rendered substantially innocuous,

b. culturing on said nitrogen-containing compound treated feedstock from said step (a) oxygenated hydrocarbon-utilizing microorganisms effective to produce polymeric gum under fermentation conditions, thereby producing said polymeric gum, and

wherein said microorganism is selected from the genera consisting of Pseudomonas, Methanomonas, Arthobacter, Corynebacterium, Bacillus, Mycobacterium, Actinomyces, Nocardia, Micrococcus, Rhodobacillus, Chromatium, Serratia, Rhizobium, Aerobactor, Escherichia, and Streptococcus.

6. A method of treating drilling mud which comprises mixing a polymeric gum product possessing water viscosifying qualities with drilling mud thereby adjusting the viscosity of said drilling mud,

wherein said polymeric gum is characterized as produced by process of microbiosynthesis as cellular production products from oxygenated hydrocarbon feedstock containing aldehydes in addition to other oxygenated hydrocarbons, which feedstock is characterized as formed by the oxidation of hydrocarbons, which process comprises the steps of:

a. adding to said oxygenated hydrocarbon feedstock containing aldehydes at least one nitrogen-containing compound reactive with said aldehydes whereby said aldehydes are rendered substantially innocuous,

b. culturing on said nitrogen-containing compound treated feedstock from said step (a) oxygenated hydrocarbon-utilizing microorganisms effective to produce polymeric gum under fermentation conditions, thereby producing said polymeric gum, and

wherein said microorganism is selected from the genera consisting of Pseudomonas, Methanomonas, Arthobacter, Corynebacterium, Bacillus, Mycobacterium, Actinomyces, Nocardia, Micrococcus, Rhodobacillus, Chromatium, Serratia, Rhizobium, Aerobactor, Escherichia, and Streptococcus.

11. A method of selective plugging of an oil-beaiang formation which comprises the steps of solubilizing at a pH below about 10 a polymeric gum possessing water viscosifying properties, injecting said solubilized polymeric gum into said formation, thereafter injecting an alkaline material into said formation sufficient to raise the pH of said solubilized polymeric gum in said formation, and thereby increasing the viscosity of said polymeric gum in said formation,

wherein said polymeric gum is characterized as produced by a process of microbiosynthesis as cellular production products from oxygenated hydrocarbon feedstock containing aldehydes in addition to other oxygenated hydrocarbons, which feedstock is characterized as formed by the oxidation of hydrocarbons, which process comprises the steps of:

a. adding to said oxygenated hydrocarbon feedstock containing aldehydes at least one nitrogen-containing compound reactive with said aldehydes whereby said aldehydes are rendered substantially innocuous,

b. culturing on said nitrogen-containing compound treated feedstock from said step (a) oxygenated hydrocarbon-utilizing microorganisms effective to produce polymeric gum under fermentation conditions, thereby producing said polymeric gum, and

wherein said microorganism is selected from the genera consisting of Pseudomonas, Methanomonas, Arthobacter, Corynebacterium, Bacillus, Mycobacterium. Actinomyces, Nocardia, Micrococcus, Rhodobacillus, Chromatium, Serratia, Rhizobium, Aerobacter, Escherichia, and Streptococcus.

3,965,986

METHOD FOR OIL RECOVERY IMPROVEMENT

Charles A. Christopher, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Oct. 4, 1974, Ser. No. 511,871

Int. Cl.[3] E21B *33/138*, *43/22*, *43/24*

U.S. Cl. 166—292 9 Claims

1. A method for reducing the permeability of a subterranean strata comprising

a. injecting a slug of fumed colloidal silica and water into the reservoir, and

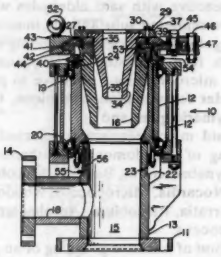
b. following the slug of fumed colloidal silica and water with a surfactant to form a gel on contact with the fumed colloidal silica slug.

3,965,987

METHOD OF SEALING THE ANNULUS BETWEEN A TOOLSTRING AND CASING HEAD

Morris S. Biffle, Odessa, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 339,037, March 8, 1973, Pat. No. 3,868,832. This application Dec. 19, 1974, Ser. No. 534,497
Int. Cl.² E21B *23/00, 33/03*
U.S. Cl. 166—315 **10 Claims**



1. Method of going into and coming out of a cased borehole with a tool string of varying outside diameter wherein the annulus formed between the tool string and the borehole wall near the casing head must be sealed against fluid flow, comprising the steps of:

1. sealing a first annulus near the casing head against fluid flow by sealingly engaging a relative small outside diameter of the tool string with a rotatable stripper rubber having a relative small inside diameter;
2. sealing a second annulus near the first annulus against fluid flow by sealingly engaging a relative larger outside diameter of the tool string with a rotatable stripper rubber having a relative larger inside diameter;
3. pulling the tool string from the borehole while a relative small outside diameter of the tool string engages the relative small inside diameter stripper rubber until a relative large outside diameter of the tool string sealingly engages the relative large inside diameter stripper rubber;
4. removing the small inside diameter stripper rubber from the casing head, while the relative larger inside diameter stripper rubber sealingly engages the relatively larger outside diameter of the tool string.

3,965,988

FIRE EXTINGUISHING METHOD AND APPARATUS

Harold R. Wesson; Lester E. Brown, and Gregory L. Puckett, all of Norman, Okla., assignors to University Engineers, Inc., Norman, Okla.

Filed Dec. 13, 1974, Ser. No. 532,407
Int. Cl.² A62C *13/38*
U.S. Cl. 169—9 **14 Claims**

1. A fire extinguishing apparatus comprising:

a pressure vessel containing a solid particulate chemical fire extinguishing agent;

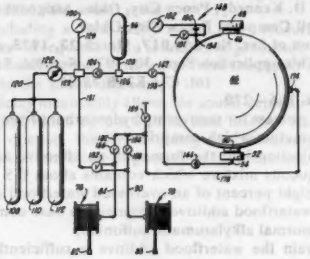
an injection pipe projecting through the lower side of the pressure vessel and terminating in the lowermost portion of the solid particulate chemical fire extinguishing agent in the pressure vessel;

a first source of gas under pressure connected to said injection pipe;

means for selectively and automatically regulating the pressure of gas delivered from said first source to said injection pipe;

a second source of gas connected to said injection pipe, said second gas source including a supply of gas at a relatively higher pressure than the regulated pressure of gas from said first source;

discharge means connected to said pressure vessel for delivering said solid particulate extinguishing agent from said pressure vessel to the situs of a fire; and



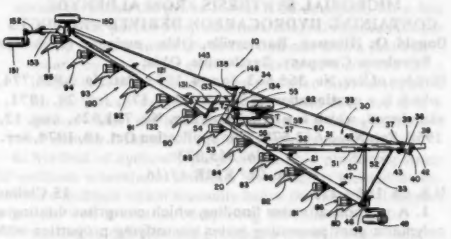
means automatically responsive to a property of the gas originating at said second source to sequentially communicate with the injection pipe, initially the second source of gas and subsequently the first source of gas, whereby gas flows at such subsequent time, at a constant pressure through said discharge means.

3,965,989

FLEXIBLE PLOW

Gerald G. Ward, Naperville, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Sept. 24, 1973, Ser. No. 400,487
Int. Cl.² A01B *3/26, 15/14*
U.S. Cl. 172—310 **18 Claims**



1. A flexible plow including:

a first plow section, said first plow section comprising a first elongated diagonal frame member having a draft means structure including means for hitching to a tractor, a plurality of plow bottoms connected through first linkage means that function to support said plow bottoms in a working position below and adjacent said first elongated diagonal frame member said plurality of plow bottoms being spaced at equal intervals along said first elongated diagonal frame member, said first linkage means functioning when said plow bottoms are in working position to transmit upward forces from said plow bottoms to said first frame member;

a second plow section, said second plow section comprising a second elongated diagonal frame member, a plurality of plow bottoms connected through second linkage means that function to support said plow bottoms in a working position below and adjacent said second elongated diagonal frame member, said plurality of plow bottoms being spaced at intervals along said second elongated diagonal frame member equal to said equal intervals, said second linkage means functioning when said plow bottoms are in working position to transmit upward forces from said plow bottoms to said second frame member, ground wheel means carried by the rear portion of said second plow section;

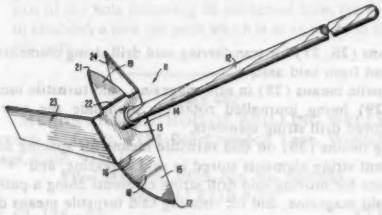
pivot means connecting the rear of said first elongated diagonal frame member to the front of said second elongated diagonal frame member such that the interval between the last plow bottom on said first elongated diagonal frame member and the first plow bottom on said second elongated diagonal frame member is substantially equal to said equal interval, the practical line of draft for said second plow section passing through the axis of said pivot means.

3,965,990

HAND HELD GARDEN IMPLEMENT

Gloucester R. Pittman, 623 N. Stone Mountain-Lithonia Road Rte. 3, Stone Mountain, Ga. 30083

Filed Apr. 21, 1975, Ser. No. 570,242
Int. Cl.² A01B *1/20, 1/10*
U.S. Cl. 172—375 **3 Claims**



1. A hand held garden implement having an elongated handle and further comprising a flat central plate portion to which the handle is affixed, said flat central plate portion having a forward side and rearward side and being generally of rectangular shape having four edges therewith, the forward and rearward sides further defining corresponding forward and rearward directions pointing away from the respective sides of the flat central plate, a handle receiving member centrally attached to the forward side of the flat central plate, said handle receiving member being of cylindrical configuration, said handle being received in said handle receiving member and projecting in the forward direction away from the central plate, a tapered digging blade integral with the flat central plate and depending from one of said edges thereof, said one edge at the juncture of the digging blade and the central plate comprising a first bend line, said digging blade terminating in a point, and wherein said point lies in a plane that passes through and lies along the longitudinal axis of the handle, the tapered digging blade being bent along the first bend line at the junction of said blade and the flat central plate, the tapered digging blade further being bent along the bend line in the forward direction toward which the handle also projects from the central plate, first and second rake blades projecting in the rearward direction with respect to the central plate, said rake blades projecting from two additional ones of said edges of the flat central plate, which additional edges are opposite each other, said rake blades projecting from the flat central plate at a diverging angle wherein the included angle between the diverging blades is less than 90°, said rake blades being of flat elongated substantially rectangular configuration, said rake blades each being most elongated in a direction pointing away from the adjacent said additional edge of said central plate.

3,965,991

MANUAL CULTIVATING TOOL

Harold O. Eads, Parkersburg, W. Va., and James W. Robison, Belpre, Ohio, assignors to McDonough Co., Parkersburg, W. Va.

Filed July 14, 1975, Ser. No. 595,694
Int. Cl.² A01B *1/10, 1/22*
U.S. Cl. 172—376 **9 Claims**

1. A cultivator of the type described comprising:
an elongated handle having a manually engageable end portion and an opposite end portion,
a tubular member having spaced opposite end portions thereof flattened, said flattened end portions having similar intermediately disposed transverse bends formed therein,
a pair of separate handle attaching elements including first portions fixed to the opposite end portion of said handle in opposed relation thereto and second portions having openings therein receiving therethrough the flattened end portions of said tube inwardly of the bends therein,
a U-shaped blade having a generally straight double edged bight portion disposed generally horizontally in operation and leg portions which extend transversely from the ends of said bight portion in a generally upward direction in operation, and
means for securing the free ends of said leg portions within the flattened end portions of said tube outwardly of the bends therein,
said openings having an interior cross-sectional configuration of a size larger than the exterior cross-sectional configuration of the flattened end portions extending therethrough and of a shape relative thereto operable to provide a limited tilting movement of said tubular member and U-shaped blade with respect to said handle and said handle attaching elements in a direction normal to the straight double edged bight portion of said blade.

3,965,992

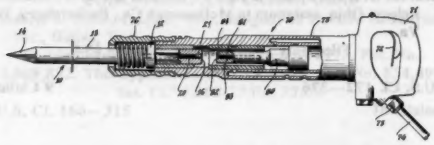
INTERNALLY SILENCED IMPACT DRIVEN TOOLS AND IMPACTING MEANS THEREFOR

James A. Swisher, 123 Silver Hill Road, Easton, Conn. 06612

Filed Mar. 6, 1975, Ser. No. 556,186
Int. Cl.² B25D *9/00*
U.S. Cl. 173—127 **16 Claims**

1. An internally silenced impact driven tool comprising a bitter end having an impact surface on one end thereof, a collar bounding the bitter end at the other end thereof, a shank, and a tip, said bitter end defining at least a portion of

at least one opening in said impact driven tool, and sound attenuating material positioned and secured within said open-



ing, said sound attenuating material comprising round hard metal shot.

3,965,993

WELL BORE PERFORATING APPARATUS

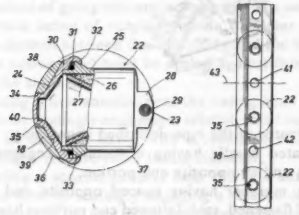
Jean Lavigne, Chevreuse; Pierre Chesnel, Savigny-sur-Orge, and Gerard Bouguyon, Plaisir, all of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Sept. 8, 1975, Ser. No. 610,945

Claims priority, application France, Sept. 20, 1974, 74.31760

Int. Cl.² E21B *43/117*; F42B *3/08*

U.S. Cl. 175—4.6 **14 Claims**



8. Perforating apparatus adapted for passage through well piping and comprising:

an elongated charge-support member formed of a tough ductile steel and having a convex forward face complementally curved for approximately fitting the interior wall of well piping of a selected internal diameter and a concave rearward face approximately parallel to said outer face and spaced uniformly therefrom;

means on said charge-support member and including a plurality of first openings spatially disposed along said charge-support member and internally threaded for respectively receiving a threaded axial protrusion on the nose of an encapsulated shaped explosive charge and securing it in facing relationship against said concave rearward face;

means on said charge-suppport member and including a plurality of second openings respectively disposed along said charge-support member between adjacent ones of said first openings and cooperatively sized for inducing transverse bends of limited magnitude respectively crossing each of said second openings upon detonation of spaced explosive charges secured in said first openings.

3,965,994

MAGAZINE FOR STORING DRILL STRING ELEMENTS

Jonas Olof Anders Hilding, Nacka, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Dec. 16, 1974, Ser. No. 533,133

Claims priority, application Sweden, Dec. 21, 1973, 7317340

Int. Cl.² E21B *9/14*

U.S. Cl. 175—52 **13 Claims**

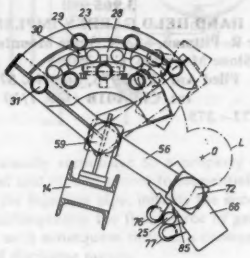
1. A drill string element handling apparatus comprising:

an elongated support (**14**),

a drilling machine (**15**) mounted on said support (**14**) for reciprocal movement therealong,

a plurality of drill string elements (**25**) for making up a drill string, said drill string being connectable at one end thereof to said drilling machine (**15**) to be driven longitudinally with respect to said support (**14**),

a magazine (**22, 23, 24**) for storing a plurality of said drill string elements laterally seriatim in a row with respect to the axis of said drill string,



means (**26, 27**) for transferring said drill string elements to and from said axis,

turnstile means (**29**) in said magazine, said turnstile means (**29**) being journalled rotatably alongside the row of stored drill string elements,

wing means (**30**) on said turnstile means for spacing adjacent string elements stored in said magazine, and

means for moving said drill string elements along a path in said magazine, and for rotating said turnstile means during movement of said drill string elements along said path.

3,965,995

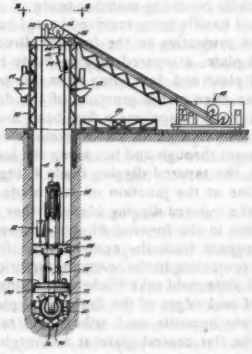
MACHINE FOR BORING A LARGE DIAMETER BLIND HOLE

David B. Sugden, Kingston Beach, Australia, assignor to The Robbins Company, Seattle, Wash.

Filed Mar. 6, 1975, Ser. No. 555,830

Int. Cl.² E21D *1/06*

U.S. Cl. 175—57 **18 Claims**



1. An earth boring machine for boring a transversely large hole, comprising:

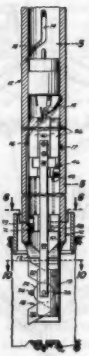
a cutter wheel including a peripheral cutter portion;
means mounting said cutter wheel for rotation about an axis transverse to the hole;
motor means for driving said cutter wheel about said axis;
advance-retract means for advancing said cutter wheel into the earth material being cut while said cutter wheel is being rotated, and for retracting said cutter wheel out from its cut;
means for maintaining said cutter wheel and its mounting means in a fixed angular position relative to the axis of the hole while said cutter wheel is being rotated and advanced into the earth material, so that said cut is in the shape of the leading portion of the cutter wheel; and
means for angularly shifting said cutter wheel and its mounting means in position about the axis of the hole following retraction of the cutter wheel from a cut, to establish a new cut path which is at an angle to the first cut path.

9. A method of boring a transversely large hole, comprising:
power rotating a cutter wheel having a peripheral cutter portion about an axis transverse to the hole;
maintaining said rotating cutter wheel in angular position relative to the axis of the hole while advancing a leading peripheral portion of said rotating cutter wheel into the earth material to form a first cut;
retracting said cutter wheel out from said first cut; and
angularly shifting said cutter wheel in position about the axis of the hole following its retraction from the first cut, to establish a new cut path which is at an angle to the first cut path.

3,965,996
MEANS AND METHOD OF DRILLING WELLS

Bernard K. Gross, 4154 Beachmeadow Lane, Westlake Village, Calif. 91361

Filed Mar. 20, 1975, Ser. No. 560,483
Int. Cl.² E21B 9/26
U.S. Cl. 175—57 **12 Claims**

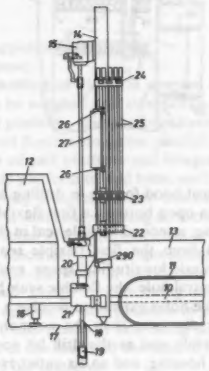


12. A means of drilling wells containing a casing and a drill string and utilizing a wireline tool, said means comprising:
a. means for continuously rotating the casing and drill string except during placement of added sections of casing and drill string;
b. a bit assembly having a diameter for reception in the drill string and a length greater than the diameter of the well casing adapted to be introduced and retrieved by the wireline tool, said bit assembly being movable through and beyond the drill string and casing;
c. means for pivoting the bit assembly when beyond the drill string and casing to a transverse position;
d. cooperating means connected to the bit assembly and tubing string for orienting the bit assembly with respect to the drill string;
e. means for securing the bit assembly in its oriented position to the lower end of the drill string for rotation therewith thereby to drill the formation ahead of the bit assembly;
f. and means for advancing both the drill string and casing as permitted by the bit assembly.

3,965,997
METHOD AND APPARATUS FOR GUIDING AND SEALING A DRILL STRING

Jonas Olof Anders Hilding, and Jan Edvard Persson, both of Nacka, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Dec. 16, 1974, Ser. No. 533,131
Claims priority, application Sweden, Dec. 21, 1973, 7317341
Int. Cl.² E21B 19/14, 19/16; E21C 9/00
U.S. Cl. 175—65 **10 Claims**



1. In a method of rock drilling by means of a string (18) of connected drill rods, said string being formed with an increased diameter at the portions where two adjacent rods are connected, comprising moving the string through a drill rod centralizer (20) while removing drill dust therefrom by suction, the improvement comprising guiding and gap-sealing of the drill string constantly during the drilling by providing first guide surface means for (216) for guiding and gap-sealing of the drill rods, and providing second and third guide surface means (218, 224; 218, 231) at respective opposite sides of said first guide surface means in the longitudinal direction of the drill rods for guiding and gap-sealing of the connection portions of adjacent drill rods; selectively moving said first guide surface means out of guiding and gap-sealing engagement with a drill rod to permit passage of a connection portion thereby, said second and third guide surface means providing guiding and gap-sealing when said first guide surface means is so moved; said first, second and third guide surface means being all located in the drill rod centralizer (20) rearwardly of the place (223) of suction so that said suction effectively seals respective clearance gaps between said first guide surface means and a drill rod and between said second and third guide surface means and a connection portion.

6. In a drill rig, in combination: an elongated support (14), a rock drill (15) mounted on said support for longitudinal movement therealong, a string (18) of connected drill rods, said string being connectable at one end thereof to said rock

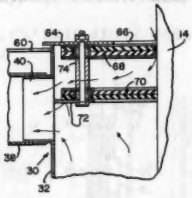
drill to be driven longitudinally with respect to said support, a drill bit (19) mounted on the other end of said string, a drill rod centralizer (20) mounted axially displaceably on said support, said drill rod centralizer having a front portion (201), and means for fixedly holding said support with respect to the ground during drilling, the improvement comprising guiding means for said drill bit in said front portion (201) of said drill rod centralizer, said guiding means having a substantial axial extent, and said drill rod centralizer having an axial extent forwardly of said support for resting against the ground when in a projected position relative to said support.

3,965,998

DUST CONTROL HOOD AND DUST CONTROL SYSTEM

Laszlo Gyongyosi, and Paul A. Lincoln, both of Clarksburg, W. Va., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Dec. 19, 1974, Ser. No. 534,177
Int. Cl.² E21B 21/00
U.S. Cl. 175—209 4 Claims



1. A dust control hood for use in drilling holes comprising: a housing with an open bottom; a first flexible seal extending across the housing; a second flexible seal in the housing longitudinally spaced from the first flexible seal to provide air passage means in said longitudinal space, each of said flexible seals having a central hole; the flexible seals being sufficiently flexible so that the holes expand to receive a drill bit and drill string of greater diameter than the normal diameter of the hole in each flexible seal as the drill bit and drill string are lowered into the housing; and an air outlet extending from the side of the housing, the first flexible seal being above the air outlet and the second flexible seal extending across the housing at a point below the top of the air outlet and above the bottom of the air outlet, said air passage means providing direct air flow from the annular space between the two flexible seals to the air outlet so that air entering the annular space through the top of the housing and between the two flexible seals may be pumped from said annular space out through the air outlet, and also so that additional air may be pulled into the open bottom of the housing through the air outlet.

3,965,999

DRILLING GRAB FOR PILE FOUNDATIONS AND WELL BOREHOLES

Hans Mathieu, Bischmisheim, and Jürgen Hochstrasser, Saarbrucken, both of Germany, assignors to Elisabeth Hochstrasser nee Wack and Jurgen Hochstrasser, both of, Germany

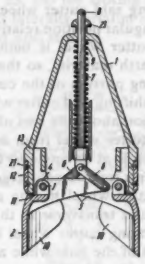
Filed Jan. 29, 1975, Ser. No. 545,104
Claims priority, application Germany, Jan. 31, 1974, 2405142
Int. Cl.² E21B 11/04
U.S. Cl. 175—238 8 Claims

1. A drilling grab for pile foundations and well boreholes comprising:

a grab body;

circular grab spades supported at the grab body end, which spades tilt from an open position into a closed position about pins located in the grab body; and

a radially projecting abutment interchangeably connected to the outer periphery of said grab body and engageable by the backs of the grab spades when located in the open position, said abutment overlapping the periphery of the grab body and characterized in that the abutment consists of extension members adapted to grab spades of different



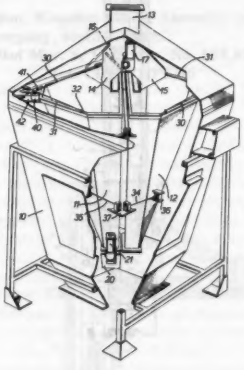
size, which members are supported on radially projecting ribs located on the grab body; on the extension members' surfaces adjacent the ribs, the extension members have a thickness corresponding to the thickness of the ribs and at their surfaces coming into engagement with the backs of the grab spades, the extension members have a surface adapted to the respective size of the spade.

3,966,000

WEIGHING APPARATUS

Clifford Edwin Allen, Cumbran, Wales, assignor to ISCA Electronics Limited, Great Britain

Division of Ser. No. 490,261, July 22, 1974. This application July 3, 1975, Ser. No. 593,029
Int. Cl.² G01G 13/22, 13/14
U.S. Cl. 177—1 5 Claims



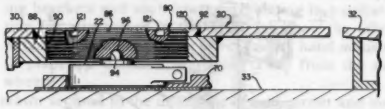
1. A method of weighing a continuous or semi-continuous flow of material, in which the flow is directed alternately between two weighing hoppers, and after filling one hopper the flow is diverted to the second hopper, during which filling operation the gross live weight of the first hopper is sensed and added to the total in a digital counter, the first hopper is emptied, and the tare weight thereof sensed and subtracted from the total in said counter, after which the flow is diverted back to the first hopper and the cycle is repeated for the second hopper.

3,966,001

PLATFORM WEIGHING SCALE

Arthur Goldberg, Fort Lee, N.J., assignor to Howe Richardson Scale Company, Clifton, N.J.

Filed Dec. 18, 1974, Ser. No. 534,086
Int. Cl.² G01G 21/00
U.S. Cl. 177—128 3 Claims



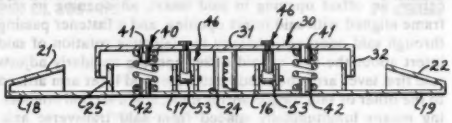
1. In a platform weighing scale, a series of load cells, a load-receiving platform structure positioned over and resting on said load cells, said platform structure including a platform which has a load cell-removal aperture in registry with each load cell, and a force-transferring member removably positioned in each load cell-removal aperture to transfer the force due to the weight of a load on said platform to said load cells, each force-transferring member being seated on its associated load cell and threadedly engaged in its associated load cell-removal aperture for selective vertical displacement to adjust the level of the adjacent region of said platform, and each load cell being upwardly removable through its associated load cell removal aperture upon removal of the force transferring member from its associated load cell removal aperture.

3,966,002

PORTABLE VEHICLE SCALES

Henry Allen Schneider, Spokane, Wash., assignor to Breakthrough Research & Development Corporation, Spokane, Wash.

Filed Sept. 12, 1974, Ser. No. 505,490
Int. Cl.² G01G 19/08
U.S. Cl. 177—136 7 Claims



1. A portable vehicle load scales for weighing heavy wheel loads, comprising:

a base;

a weighing platform for receiving a vehicle wheel thereon;

a plurality of calibrated compression springs mounted in an array on the base supporting the platform and the vehicle wheel above the base in which the springs are compressively deflected in proportion to the wheel load applied to the platform;

pre-loading means operatively connected between the base and platform to move the base and platform closer together for initially compressively deflecting the array mounted springs to a desired loading prior to supporting the vehicle wheel on the platform;

a variable capacitor transducer operatively connected between the platform and the base that is responsive to the compressive deflection of the springs for measuring the applied wheel load, said capacitor transducer comprising at least two electrodes separated by a layer of elastic dielectric material that is compressively responsive to the deflection of the springs with the electrical capacitance of the transducer varying in accordance with the deflection of the springs so that the magnitude of the electrical capacitance of the transducer represents the magnitude of the applied wheel load supported on the platform;

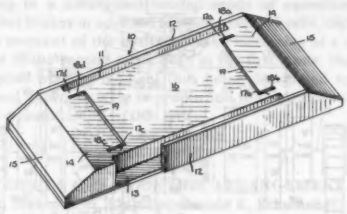
and electrical means operatively connected to the transducer for measuring the magnitude of the electrical capacitance of the transducer and for visually displaying the magnitude in terms of the weight of the wheel load supported on the platform.

3,966,003

WEIGHING APPARATUS

Henry F. Miller, Clifton, N.J., assignor to Uniroyal Inc., New York, N.Y.

Filed Oct. 15, 1974, Ser. No. 514,518
Int. Cl.² G01G 3/14
U.S. Cl. 177—211 7 Claims



1. Weighing apparatus comprising:

a supporting base;

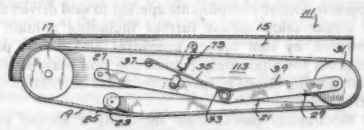
an elongated horizontal platform adapted to be loaded by an object to be weighed and attached to said base at two ends of said platform, said platform having four horizontally displaced flexible elongated parallel supporting arms in the plane of said platform and integral therewith and attaching said platform to said base, each of said supporting arms having attached thereto one or more electrical strain sensors, said sensors being so located on said arms and so connected in a single electrical bridge circuit as to provide an electrical signal representative of the load applied to said platform in a direction normal to said platform, said bridge circuit being non-responsive to shear loads applied to said platform in planes parallel to the plane of said platform and being non-responsive to the location of the load and the area of contact between the load and the platform.

3,966,004

SINGLE LINK SLIDE RAIL SUSPENSION SYSTEM

Edgar Rose, Glencoe, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed July 22, 1974, Ser. No. 490,286
Int. Cl.² B62M 27/02
U.S. Cl. 180—5 R 11 Claims



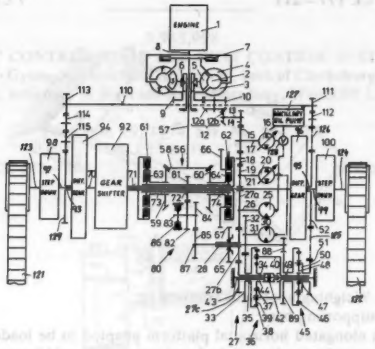
1. A snowmobile comprising a frame, a track drive sprocket mounted on said frame, a track suspension carrier including, adjacent to the forward end thereof, an upwardly and forwardly extending lower surface, a suspension link pivotally connected at one end to said frame rearwardly of said sprocket and pivotally connected to said carrier rearwardly of said surface, said suspension link constituting the sole rigid link connecting between the carrier and said frame and including a portion extending rearwardly from the connection of said link with said carrier, an idler wheel rotatably carried by said extending link portion adjacent to the rearward end thereof, and means urging said carrier away from said frame.

3,966,005

COMPOUND STEERING SYSTEM FOR ENDLESS-TRACK VEHICLES

Bernhard Binger, Ravensburg, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Jan. 15, 1975, Ser. No. 541,108
Int. Cl.² B62D *11/16*
U.S. Cl. 180—6.44 **8 Claims**



1. A vehicular steering system comprising:

a pair of driven shafts coupled with respective traction elements on opposite sides of a vehicle body;

a hydraulic torque converter with an input side and an output side;

an engine coupled to said input side;

reversible transmission means linking said output side with said driven shafts, said transmission means having two branches including respective differential-gear sets each having a driving input and a steering input;

a continuously adjustable hydraulic power train coupled with said input side;

a supplemental mechanical power train coupled with said output side;

additive gear means provided with a first input shaft drivable from said engine via said hydraulic power train, a second input shaft drivable from said torque converter via said mechanical power train, and an output shaft; and

link means forming two relatively reversed driving connections from said output shaft to said steering inputs for translating any rotation of said output shaft into mutually opposite torque components applied to said driven shafts;

said transmission means further including a main shaft powered by said torque converter and a first pair of clutches for alternately connecting said main shaft with both driving inputs to reverse the sense of rotation of said driven shafts;

said mechanical power train including a second pair of clutches for alternately connecting said main shaft with said second input shaft for rotating said output shaft in either of two directions;

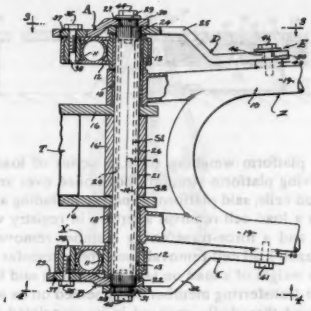
said additive gear means including a first and a second planetary-gear set in cascade with each other, each of said planetary-gear sets having two inputs, said hydraulic power train including pump means drivable by said engine and a pair of hydrostatic motors fluidically linked with said pump means, said motors being connected with respective inputs of said first planetary-gear set, said mechanical power train being connected with one input of said second planetary-gear set, the other input of said second planetary-gear set being connected with the output of said first planetary-gear set.

3,966,006

DUAL SPRING REAR SUSPENSION FOR MOTORCYCLES

John R. Cullinan, 2323 235th Place, Torrance, Calif. 90501

Continuation-in-part of Ser. No. 325,725, Jan. 22, 1973, abandoned. This application Oct. 31, 1974, Ser. No. 519,511
Int. Cl.² B62D *61/02*; B62K *11/02*
U.S. Cl. 180—32 **6 Claims**



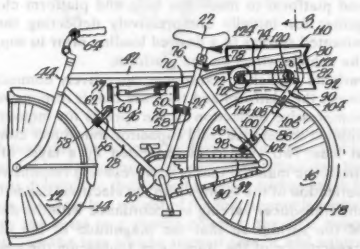
1. An adjustable rear suspension system for a motorcycle having a frame, said system comprising: a bearing means on the rear of said frame on a transverse, horizontally disposed axis; a rearwardly extending, rear wheel mounting fork; means at the forward end of said fork rotatably engaged on said frame about said axis; a torsion spring journaled in said bearing means about said axis, said spring having opposite ends projecting from respective ends of said bearing means; a first lever arm affixed to one of said torsion spring ends; a first connecting means for adjustably connecting said first lever arm to said frame, said first connecting means comprising a receiver in said first lever arm longitudinally spaced from said axis, an insert selectively rotationally mounted in said receiver, an offset opening in said insert, an opening in said frame aligned with said insert opening, and a fastener passing through said openings whereby the selective rotation of said insert about the axis of said offset opening angularly adjusts said first lever arm about said axis; a second lever arm affixed to the other of said torsion spring ends; and a second connecting means longitudinally spaced from said transverse axis, securing said second lever arm to said fork.

3,966,007

ELECTRICBIKE

Ralph L. Havener, Decatur, and Harry F. Dunakey, Harristown, both of Ill., assignors to Lectra Bike Corporation, Decatur, Ill.

Filed Nov. 20, 1974, Ser. No. 525,463
Int. Cl.² B60K *1/00*
U.S. Cl. 180—34 **5 Claims**



1. In an electric drive propelling a multiwheeled vehicle with a tubular frame, the combination comprising:

a battery secured to the frame;

a motor carrier pivotally connected to the frame adjacent a driven wheel, said carrier having a pair of supporting brackets extending downwardly from the underside of the carrier one on either side of the driven wheel, a pair of adjustable braces extending between the supporting brackets of the motor carrier and a vehicle frame member, said braces being pivotally connected to the supporting brackets and each brace terminating in a collar portion for attachment to the frame member, the effective length of the braces being selectable by hand adjustment to pivot the carrier toward and away from the driven wheel;

a motor secured to the underside of said carrier and including a shaft driven by the motor;

a motor sprocket mounted on said motor shaft;

a drive shaft journaled on the underside of said carriage;

a drive sprocket on said drive shaft;

a friction wheel mounted on said drive shaft for frictional engagement with the driven wheel of the vehicle;

an endless chain trained on said motor and drive sprockets for transferring the rotation of the motor shaft to the drive shaft whereby the friction wheel drives the vehicle; and

a circuit having a normally open, spring-loaded control switch to connect the motor with the battery.

3,966,008

BRAKE SYSTEM FOR VEHICLES

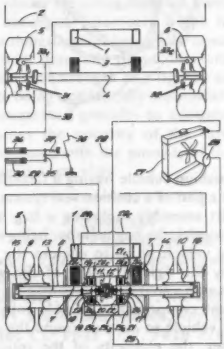
Hermann Klaue, 24, Tour D'Ivoire, 1820 Montreaux, Switzerland

Continuation of Ser. No. 331,697, Feb. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 171,866, Aug. 16, 1971, abandoned. This application July 11, 1975, Ser. No. 595,007

Claims priority, application Germany, Aug. 24, 1970, 2041867; Switzerland, July 19, 1971, 10561/71; Apr. 7, 1972, 5122/72

Int. Cl.² B60T *8/02*

U.S. Cl. 180—75 **17 Claims**



1. In a vehicle with an engine and a radiator, with a plurality of axles, at least one including driven wheels and one including non-driven wheels and a transmission system including driving shafts drivingly engaged with said driven wheels and the vehicle engine, a brake system including wheel brakes and at least one drive line auxiliary brake, characterized by the combination of:

wheel brakes in the wheels of at least one of said axles, at least one auxiliary brake and actuating means including a singular application means, a first brake circuit means for operating said wheel brakes and a second brake circuit means for operating said auxiliary brake, both of said brake circuit means being operable in response to said actuating means;

said auxiliary brake being a friction disc brake comprising friction elements which are dry on their friction engaging surfaces and being free of self-intensification effects, said auxiliary brake being designed with a capacity to absorb at least twice the maximum brake energy as that which can be absorbed by the said wheel brakes, and means for watercooling said auxiliary brakes;

and actuating means including means for operating said auxiliary brake alone in a first mode of operation, during which said wheel brakes remain unbraked, and for operating in a subsequent second mode of operation said wheel brakes in addition to said auxiliary brake, the braking moment of the auxiliary brake increasing at a slower rate in the second mode than in the first mode, the total applied braking moment thus being distributed to each wheel approximately in proportion to the distribution of the dynamic load to that wheel.

3,966,009

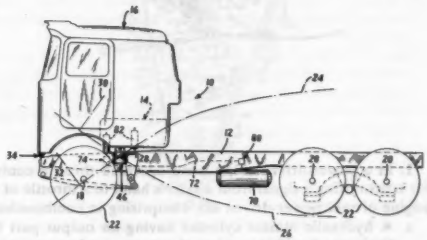
VEHICLE CAB MOUNTING ARRANGEMENT

Leslie A. Meacock, II, Emmaus; Donald R. Schumaker, Allentown, and Robert F. Zalokar, Emmaus, all of Pa., assignors to Mack Trucks, Inc., Allentown, Pa.

Filed Dec. 17, 1974, Ser. No. 533,548

Int. Cl.² B62D *33/06*

U.S. Cl. 180—89 A **4 Claims**



1. In a tractor adapted to be coupled to a semitrailer, the tractor having a frame capable of vibratory, beam-like bending about at least one nodal point, an engine mounted on the frame, a cab mounted on the frame to overlie the engine, and a reservoir adapted to contain air under pressure, the improvement comprising:

a. first support means for resiliently mounting a rear portion of the cab on the frame substantially at the nodal point, the first support means including a pneumatic spring mounted at one end to the frame and being adapted for coupling at the other end to the cab, the pneumatic spring having a natural frequency of about one and a half cycles per second, and two shock absorbers located adjacent the pneumatic spring at opposite sides thereof, each shock absorber being mounted at one end to the frame and being coupled at the other end to the end of the pneumatic spring remote from the frame;

b. means communicating the reservoir with the pneumatic springs for conducting pressurized air from the reservoir to the pneumatic springs, the conducting means including leveling valve means for controlling the flow of air to and from the pneumatic spring so as to adjust the air pressure within the spring and maintain the rear portion of the cab adjacent the spring at a relatively constant vertical position relative to the frame despite changes in static loading of the cab; and

c. second support means for securing a front portion of the cab to the frame so as to permit pivotal movement of the cab relative to the frame about an axis extending transversely of the frame, the second support means transmit-

ting to the cab vibratory movement of the frame at the second support means, the second support means being located at the front end of the frame and spaced longitudinally of the frame from the first support means.

3,966,010

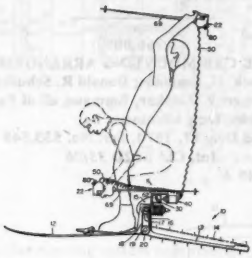
POWER DRIVEN SKI'S THROTTLE AND SHUT-OFF CONTROL

Samuel Shiber, Mundelein, Ill., assignor to Saroy Engineering, Wheaton, Ill.

Filed June 16, 1975, Ser. No. 587,342

Int. Cl.² B62M 27/02

U.S. Cl. 180—103 BF **8 Claims**



1. In a power-driven ski, a hand operated throttle control for transmitting a signal from a skier's hand to a throttle of an engine of said power-driven ski, comprising in combination:

a. A hydraulic master cylinder having an output part for displacing liquid through said output port in response to a mechanical signal from a skier's hand,

b. a hydraulic slave cylinder connected to said engine having an input port for receiving said liquid and translating it to a mechanical signal for actuating said throttle of said engine, and

c. a resilient helically coiled extension spring tube assembly connecting said output and input ports, said assembly maintaining a minimum length pass between said master and slave cylinders while allowing one to move freely relative to the other, without interfering with the signal being transmitted between said cylinders.

3,966,011

RETARDER CONTROL DEVICE

Teruo Minami, Yokohama, and Masaru Uenoyama, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

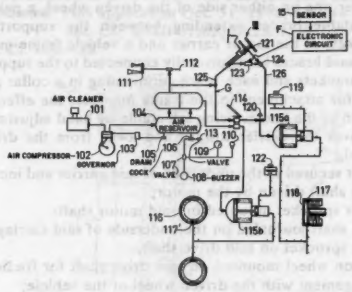
Filed June 25, 1974, Ser. No. 482,904

Claims priority, application Japan, Nov. 21, 1973, 48-130131

Int. Cl.² B60T 7/12

U.S. Cl. 180—105 E **3 Claims**

1. A retarder control device for a vehicle having a drive train, including a torque converter, and an oil-cooled multiplate disc brake comprising solenoid and hand brake valves connected in parallel to a pneumatic line connected from a pneumatic pressure generating source to a chamber and cylinder of the brake, a check valve provided in the pneumatic pressure line for checking oil flow from the solenoid and hand brake valves and an electronic circuit means responsive to the rotational speed of the torque converter for controlling the



energization of the solenoid of the solenoid valve and thereby the application of the brake.

3,966,012

AIR CUSHION VEHICLES

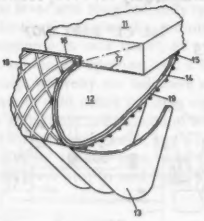
Peter Rowland Crewe, Newport, England, assignor to British Hovercraft Corporation Limited, Yeovil, England

Filed Feb. 20, 1975, Ser. No. 551,089

Claims priority, application United Kingdom, Feb. 21, 1974, 8039/74

Int. Cl.² B60V 1/16

U.S. Cl. 180—127 **4 Claims**



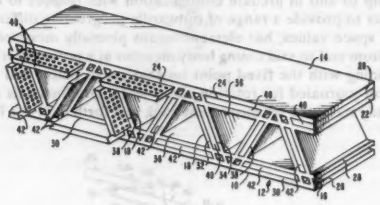
1. In an air cushion vehicle having a flexible skirt assembly forming at least a part of a cushion seal system for the vehicle, the flexible skirt assembly including a bag member formed from flexible material, the bag member being attached to rigid structure of the vehicle so as to enclose the outlet end of a duct defined by the rigid structure of the vehicle to be in communication with a source of pressurized air on the vehicle, the improvement comprising a flexible reticulated member attached to the vehicle so as to surround the outer surface of the bag member, the elasticity of the reticulated member being less than the elasticity of the bag member so that, in operation of the vehicle, pressurized air flowing from the duct inflates the bag member away from the rigid structure of the vehicle into contact with the reticulated member, thereby transferring some of the loading in the bag member to the reticulated member, and a sheet of buffer material interposed between the bag member and the reticulated member for preventing chafing between the two members and the reticulated member being arranged around the bag member so that the lines formed by the net structure of the reticulated member bisect a substantially horizontal line extending parallel with the longitudinal run of the skirt assembly at angles other than normal.

3,966,013

MULTI-PLY WOVEN ARTICLE HAVING ACOUSTICAL ELEMENTS BETWEEN DOUBLE PLIES

Donald M. Hatch, Huntington Beach, and George D. Lee, Monterey Park, both of Calif., assignors to Hitco, Irvine, Calif.

Continuation of Ser. No. 290,542, Sept. 20, 1972, abandoned.
This application Sept. 20, 1974, Ser. No. 507,771
Int. Cl.² F04B 1/99; G10K 11/04
U.S. Cl. 181—33 G 6 Claims



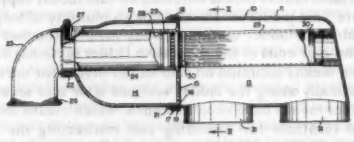
1. A multi-ply woven acoustical panel comprising a woven fabric having a pair of opposite, spacedapart, generally planar faces and a plurality of intermediate ribs of generally planar configuration extending between and being interwoven with the opposite faces, the faces and the ribs defining a plurality of acoustical chambers within the panel and between the opposite faces, the planar faces and the intermediate ribs including pairs of generally planar, spaced-apart plies defining relatively thin, generally planar chambers which border the acoustical chambers, at least the pairs of generally planar, spaced-apart plies of the woven fabric being of relatively open weave construction and having at least adequate porosity to relatively free pass acoustical waves therethrough, and a plurality of relatively thin, generally planar elements of size and shape similar to and disposed within the relatively thin, generally planar chambers, the pairs of plies defining the relatively thin, generally planar chambers combining with the relatively thin, generally planar elements disposed therein to form skins bounding the acoustical chambers which have a thickness many times less than the thickness of the acoustical chambers, the relatively thin, generally planar elements providing the skins with substantial strength and rigidity and at least some of the elements being acoustically transmissive elements and having a predetermined porosity to acoustical waves which largely determines the porosity of the skins to acoustical waves when combined with the porosity of the pairs of generally planar, spaced-apart plies.

3,966,014

AIR INTAKE SILENCER

George A. Gowing, Valcourt, Canada, assignor to Bombardier Limited, Valcourt, Canada

Filed Mar. 8, 1974, Ser. No. 449,449
Claims priority, application Canada, Nov. 22, 1973, 186483
Int. Cl.² F02F 1/34; F02B 77/00
U.S. Cl. 181—35 A 11 Claims



1. An air intake silencer for an internal combustion engine of the two-stroke cycle type and having outlet means for connection to the intake side of engine carburetor means, comprising:

a. a housing having said outlet means, said housing defining a first chamber of elongate form transversely of said outlet means, and having an inlet opening at one end,

b. a tubular inlet duct extending through said inlet opening and having a perforate section extending within said first chamber transversely of said outlet means and terminating close to an end of said first chamber opposite to said inlet opening,

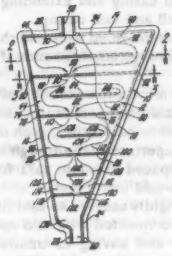
c. one wall of said first chamber being defined by a perforate plate on an opposite side of which is a resonance chamber which communicates with the first chamber through perforations in said one wall but is otherwise closed.

3,966,015

SILENCER ELEMENT

Wilfred A. Bychinsky, Burton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 19, 1975, Ser. No. 551,017
Int. Cl.² F01N 1/08
U.S. Cl. 181—56 3 Claims



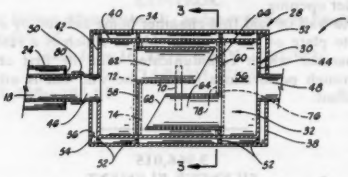
1. A wave interference silencer comprising: a housing having a pair of sidewalls and a top and a bottom joined together to define an exhaust flow volume, an end wall in said housing including an inlet into said exhaust flow volume, an outlet on the opposite end of said housing from said exhaust flow volume, a plurality of intermediate interior walls formed transversely of said volume having ends thereof in sealed relationship to said side walls to separate said exhaust flow volume into a plurality of interior compartments, each of said transverse wall portions including an opening therethrough for communicating adjacent ones of said compartments, a baffle plate located within each of said compartments, each of said baffle plates being formed in spaced parallellism with said intermediate interior walls and including opposite ends thereon in spaced relationship with said side walls to define a continuous flow path through said compartments, each opposite end of each of said baffle plates being laterally spaced asymmetrically with respect to the opening through said intermediate interior walls to define a first acoustical path around one end of said baffle plate and a second acoustical path of greater length than that of said first acoustical path around the opposite end of said baffle plate, said first and second acoustical paths having lengths which define a ratio to produce wave cancellation of a predetermined frequency as exhaust flow passes from said of one compartments around the baffle therein for flow through a downstream opening in an intermediate wall defining a next adjacent compartment within said exhaust flow volume of said housing.

3,966,016

MUFFLER CONVERTER

Victor Hecht, 969 Alexander Drive, Haysville, Kans. 67060

Continuation-in-part of Ser. No. 351,491, April 16, 1973, abandoned. This application Nov. 15, 1974, Ser. No. 524,071
Int. Cl.² F01N 1/08
U.S. Cl. 181—57 8 Claims



1. A muffler for an internal combustion engine exhaust gas system, comprising:

a. a hollow shell having a sidewall and opposite ends,

b. a hollow casing enclosed in said hollow shell in a spaced relation thereto, defining a cavity therein, and having a sidewall and opposite ends,

c. an inlet conduit mounted through said shell and rigidly mounted to said casing and extending through adjacent ends of said shell and said casing,

d. an outlet conduit mounted with said shell and said casing and extending through adjacent ends of said shell and said casing,

e. a first baffle member and a second baffle member rigidly mounted with said casing sidewall in said casing cavity in a spaced relation to each other, each of said baffle members having an aperture therethrough with said apertures disposed in a spaced relation, said first baffle member being closest to said inlet conduit,

f. a first conduit rigidly secured to said first baffle member, communicably connected with said aperture in said first baffle member and having its unattached end portion extending toward said second baffle member, and

g. a second conduit rigidly secured to said second baffle member, communicably connected with said aperture in said second baffle member and having its unattached end portion extending toward said first baffle member, said muffler is constructed and adapted to in use receive exhaust gases from an internal combustion engine through said inlet conduit, pass said exhaust gases through said first conduit into said casing cavity, from said casing cavity through said second conduit and out said outlet conduit.

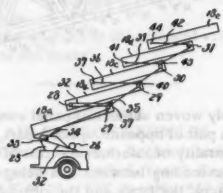
3,966,017

WORKING RANGE INDICATING DEVICE FOR AERIAL LADDER TRUCK

Kikuo Maeda, Tondabayashi, and Takashi Tomimoto, Nara, both of Japan, assignors to Morita Pump Kabushiki Kaisha, Osaka, Japan

Filed Feb. 12, 1975, Ser. No. 549,289
Int. Cl.² E06C 5/04, 5/34
U.S. Cl. 182—18 2 Claims

1. In an aerial ladder truck assembly having a turntable mounted on the body of the truck, ladder supporting means mounted on the turntable, an extensible, sectional ladder unit pivotally mounted at one end to said ladder supporting means, means to pivot the ladder unit, means to extend and contract the ladder sections of the ladder unit, and an operating stand mounted on the turntable, the improvement of a ladder unit working range indicator mounted on the operating stand for simultaneously indicating the vertical angle and the degree of extension of the ladder unit, said working range indicator comprising a casing body member mounted on said operating stand, a transparent gauge plate having a fixed point adjacent its lower edge mounted on said casing body member, said gauge plate having a plurality of vertical angle indicating scale marks present thereon, said vertical angle indicating marks each extending radially outwardly from the fixed point and in laterally spaced, equidistance relationship with respect to one another to provide a range of laterally spaced different angle values, said gauge plate further having a plurality of arcuate linear distance indicating scale marks present thereon, said arcuate linear distance indicating scale marks each extending outwardly from the fixed point in longitudinally spaced relationship to and in arcuate configuration with respect to one another to provide a range of outwardly progressing different linear space values, bar element means pivotally mounted at its bottom end to said casing body member at a point generally coinciding with the fixed point on said gauge plate, said bar element journaled for rotation about its longitudinal axis and pivotally mounted for movement back and forth over the face



of said gauge plate, said bar element means including an elongated threaded portion, a nut element threadably mounted thereon, scale indicating means associated with said nut element, and means permitting the axial movement of the nut element along the elongated threaded portion upon rotation of the threaded portion about its longitudinal axis, first actuating means operatively connected between said bar element means and the means for pivoting the ladder unit to pivot said bar element means over the vertical angle indicating scale marks on said gauge plate to indicate the vertical angle of the ladder unit, and second actuating means operatively connected between the base element means and the means for extending and contracting the ladder unit to rotate the bar element means about its vertical axis causing the indicating means carried by the nut element to move axially along the threaded portion and over the linear distance indicating scale marks of the gauge plate to indicate the distance of contraction or expansion of the ladder unit.

3,966,018

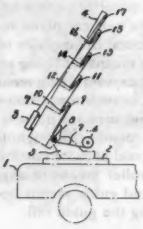
WORKING PLATFORM LIFTING APPARATUS FOR AERIAL LADDER TRUCK

Tetsuo Kozai, Higashiosaka, and Shomitsu Shiraki, Osaka, both of Japan, assignors to Morita Pump Kabushiki Kaisha, Osaka, Japan

Filed Feb. 12, 1975, Ser. No. 549,299
Int. Cl.² A62B 1/00
U.S. Cl. 182—103 5 Claims

1. The combination in an aerial ladder truck of a turntable mounted on and adjacent the rear end of the truck, a ladder supporting structure mounted on the turntable, extensible and contractable ladder means mounted on said ladder supporting structure, said ladder means including a plurality of longitudinally movable ladder sections, pulley means mounted at the front and rear ends of the successive ladder sections, working platform means mounted on said ladder means for movement longitudinally along the ladder sections after said sections of the ladder means have been extended, winch means mounted on said turntable for extending and contracting the ladder sections of said ladder means and raising and lowering the working platform member only after the ladder sections have been placed in an extended or contracted state, cable means mounted at one end to said winch means and thereafter passed

in zig zag arrangement successively around each of the front and rear mounted pulley means of each ladder section of said ladder means with the opposite end of said cable means being connected to said working platform means, hydraulic motor means operatively connected to said winch means for extending or contracting the ladder sections and to raise or lower the working platform means only after the ladder sections have been first placed in an extended or contracted state, braking means for said winch means to stop the rotation of said winch



means, actuating means for actuating said hydraulic motor means, and electrical circuit means between said actuating means and said hydraulic means, said electrical circuit means including first solenoid means for energizing the braking means of said winch means when the actuating means are in a neutral position and second solenoid means having switch means energized by said working platform means to place the actuating means in a neutral position when the platform means has reached the desired uppermost limit on said ladder means.

3,966,019
LUBRICATING SYSTEM OF PRESSURE FLUID OPERATED ROCK DRILL MACHINES

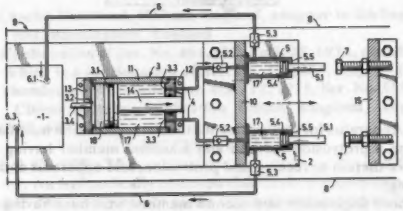
Viekko Heikkila; Leo Hakkinen; Rolf Strom; Leo Uusitalo, and Juha Mellin, all of Tampere, Finland, assignors to OY Tampella AB Mechanical Workshops, Tampere, Finland

Filed June 13, 1975, Ser. No. 586,996

Claims priority, application Finland, June 18, 1974, 1867/74

Int. Cl.² F16N 7/14

U.S. Cl. 184—7 D **7 Claims**



1. Lubrication system for rock drill machine operated by pressurized fluid, said rock drill machine comprising a rock drill unit mounted on a slide reciprocable by power feed means relative to stationary rail means, said lubrication system comprising a reservoir of lubricant, lubricant dosage means having an input connected to said reservoir of lubricant for receiving lubricant from said reservoir, conduit means connected between lubrication points on said machine and an output of said dosage means, and means for automatically and recurrently feeding an adjustable lubricant quantity into said conduit means upon reciprocation of said slide relative to said rail, each of said dosage means comprising a cylinder into which lubricant is fed from said reservoir, a piston reciprocable in said cylinder, and a piston rod attached to said piston, said piston rod being engageable with an abutment upon reciprocation of said slide.

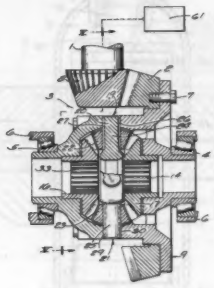
3,966,020
DIFFERENTIAL LUBRICATION SYSTEM

David C. Quick, New Berlin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 4, 1974, Ser. No. 529,350

Int. Cl.² F16N 7/26

U.S. Cl. 184—11 R **10 Claims**



1. A differential of a vehicle having lubricating means comprising, a differential casing defining differential spider bearing surfaces, a differential spider supported by said differential casing, at least two differential pinion gears rotatably mounted on said differential spider, a pair of side gears rotatably mounted in said casing and engaging said differential pinion gears, a differential housing rotatably supporting said differential casing and defining a cavity for lubrication, a ring gear connected to said differential casing for driving said differential about an axis common with the axis of rotation of said side gears, said differential spider defining lubricating passages on said spider shafts extending from the external periphery of said differential casing to the bearing interface between said differential gears and said shaft of said differential spider, a propeller shaft pinion gear driving said ring gear and defining a cone angle directed toward the lubricating passages on said spider shafts for throwing lubricant against the periphery of said differential casing and passages for lubricating the interface between the differential spider shaft and said differential pinion gears through said lubrication passages when said differential is in operation.

3,966,021
AIR LINE LUBRICATORS AND THE LIKE

Ian Willoughby Hyslop, Johannesburg, South Africa, assignor to West Rand Engineering Works (Proprietary) Ltd., Drugersdorp, Transvaal, South Africa

Filed Feb. 28, 1974, Ser. No. 447,122

Int. Cl.² F16N 7/32

U.S. Cl. 184—56 R **2 Claims**

1. A lubricator for an air line comprising:

a tubular casing defining a chamber therein, said casing having a first open end, and a second end opposite said first end,

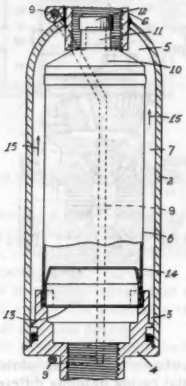
a removable cap member operatively connected to said casing at said first end and including an axial passage therethrough for permitting passage of air from an air line connected to said cap member into said chamber,

said cap member comprising first socket means extending into said chamber,

means defining an outlet from said chamber located at the said second end, said outlet defining means comprising second socket means extending into said chamber,

a removable reservoir in said chamber containing viscous material, and having a first end in said first socket means, said reservoir first end having piston means therewithin facing towards said axial passage in said removable cap member for impingement of air thereon to move said piston means into said reservoir away from said reservoir first end, said reservoir having a second end comprising spout means extending into said second socket means and comprising an outlet port,

said socket means comprising means for receiving and releasably supporting said reservoir in spaced relation to



the inner walls of said chamber, and further comprising means permitting the passage of air therethrough when said reservoir is in place in said socket means,

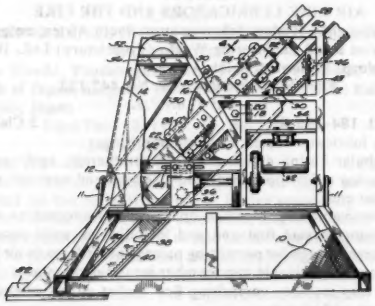
whereby said cap may be removed and said reservoir introduced into said chamber, and air will flow through said passage in said cap, impinge on and urge said piston means away from said first ends, flow through said first socket means, around said reservoir and thence through said second socket means, past said reservoir outlet port, entraining small quantities of viscous material from said reservoir, and thence pass out said outlet of said casing.

3,966,022

WHEELCHAIR LIFT ASSEMBLY

Robert W. Cheney, 1533 N. 122nd St., Wauwatosa, Wis. 53213

Filed Oct. 15, 1974, Ser. No. 515,001
Int. Cl.² B66B 9/08
U.S. Cl. 187—12 **7 Claims**



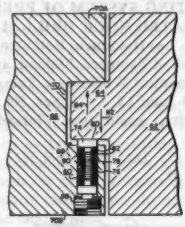
1. A wheelchair lift assembly intended for installation in a stairwell and adapted to travel along a guide rail which is provided on one of the walls of the stairwell, the wheelchair lift comprising a generally vertically positioned frame member located adjacent to the wall having a guide rail, a generally horizontally extended wheelchair support platform fixed to said frame member and extending outwardly from the stair side of said frame member; a sub-frame member provided with roller means which is adapted to engage and travel along the guide rail; said sub-frame member being a generally vertically extending plate having an arcuate portion which is rotatably fixed to said frame member at a central point relative to said arcuate portion in order to permit adjustable rotation of said roller means in the vertical plane to thus maintain the support platform horizontal irrespective of the angle of inclination of the guide rail; means for fixing said sub-frame member to said frame member, said fixing means being positioned on said frame member in such a position as to be capable of engaging and fixing said arcuate portion of said sub-frame member to said frame member throughout the rotatable adjustment movement of said arcuate portion about said central point to thus fix said roller means in anyone of its adjusted positions; and power and guide means operable to transport the wheelchair lift along the guide rail.

3,966,023

NOZZLE CHAMBER FRICTION DAMPER

Kuo P. Huang, Broomall, and John J. Walsh, III, Newtown Square, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 21, 1975, Ser. No. 560,459
Int. Cl.² F16F 7/08
U.S. Cl. 188—1 B **16 Claims**



1. Apparatus for dampening motion between a first member having a protrusion thereon and a second member having a groove therein to receive said protrusion, said apparatus comprising:

a bore disposed in said second member, said bore having a ledge disposed therein;

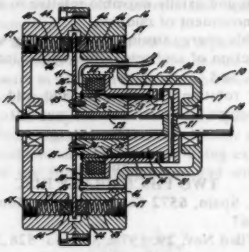
a friction generating member movably disposed within said bore; and,

means for biasing said friction generating member into an abutting interface with said protrusion on said first member as said protrusion is received within said groove in said second member, said bias means acting on said friction generating member to cause a portion thereof to extend from said bore to establish said abutting interface, said bias means being disposed within said bore and maintained in a biasing relationship with said friction generating member by abutting against said ledge so that relative motion between said first member and said second member generates a friction force along said abutting interface to dampen the relative motion therebetween.

3,966,024
HELICAL SPRING CLUTCH

John S. Baer, Bar Harbor, Maine, assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Jan. 23, 1975, Ser. No. 543,236
Int. Cl.² F16D 67/02
U.S. Cl. 188—71.2 4 Claims



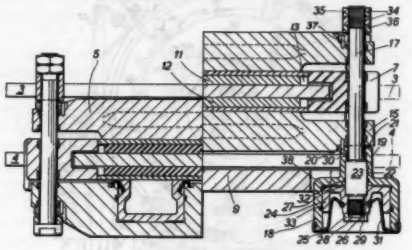
1. A brake mechanism comprising a clutch having a normally rotatable input member and a normally stationary output member supported for relative rotation about a common axis, a coiled helical spring telescoped with said members and having one of its ends connected to said output member, a normally stationary collar telescoped with at least one of said members and connected to the other end of said spring, means for causing said collar to shift axially into and out of frictional engagement with said input member, said collar being rotated by said input member when in frictional engagement with said input member and being operable when rotated to cause said spring to flex radially and couple said output member for rotation with said input member, a disc rigid with and projecting radially from said output member, a brake comprising friction material located to rub against said disc and operable to frictionally retard rotation of said disc and said output member and thereby retard rotation of said input member when the latter is coupled to said output member by said spring, and resiliently yieldable means for pressing said friction material against said disc.

3,966,025
HYDRAULICALLY OPERATED DISC BRAKES FOR VEHICLES

Charles Newstead, Walsall, England, assignor to Girling Limited, Birmingham, England

Continuation of Ser. No. 464,222, April 25, 1974, abandoned, which is a continuation of Ser. No. 170,254, Aug. 9, 1971, abandoned. This application Mar. 18, 1975, Ser. No. 559,591
Claims priority, application United Kingdom, Aug. 21, 1970, 40275/70
Int. Cl.² F16D 55/228
U.S. Cl. 188—72.5 6 Claims

1. An hydraulically operated disc brake comprising a rotatable disc, two pressure plates for applying respective friction pads to opposite faces of the disc and at least one hydraulically-operated actuator for urging the pressure plates towards each other on application of the brake, said actuator comprising a cylinder housing having an open outer end, an end wall of the housing acting on one of the pressure plates and having a bore, a piston movable in the housing and having a stepped bore comprising a first bore portion of smaller diameter located adjacent to said open outer end, a second bore portion of larger diameter located adjacent to said end wall, and a step between said first bore portion and said second bore portion, a draw bar detachably connected to the piston and extending through said bore in said housing and over the peripheral edge of the disc to act on the second pressure plate, said draw-bar having a screw-threaded, reduced diameter end first portion having a free end, a second portion of a diameter larger than and continuous with said first portion, and a shoulder between said first portion and said second portion, at least part of said second portion of said draw bar being firmly accommodated within said second bore portion of said stepped bore over a contact area such that said shoulder engages said step in said bore, a first seal between said second portion of said draw bar and said housing disposed within said contact area, a second seal between said second portion of said draw bar and said

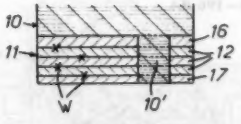


second bore portion of said stepped bore in the piston, at least one nut screwed onto said first portion of the draw bar which projects through said piston and which is accessible through said open end of said housing, said nut clamping said shoulder and said step together, and positive locating means on said free end of said draw bar for engagement with a tool to enable said draw bar to be held against rotation at least when said nut is being tightened and untightened.

3,966,026
NOISE-REDUCING SUPPORT FOR FRICTION LININGS OF BRAKING DEVICES

René Gabriel Filderman, Asnieres, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Dec. 6, 1974, Ser. No. 530,503
Claims priority, application France, Oct. 17, 1974, 74.34890
Int. Cl.² F16D 65/02
U.S. Cl. 188—73.5 19 Claims



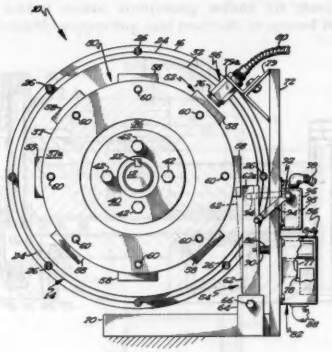
1. A noise-reducing support for a friction lining of a braking member in which said lining is fixed to said support and is adapted to be clamped against a friction track by the effect of an action applied on said support, said support comprising a stack of a plurality of sheets, all metallic, contiguous to each other over their whole surface being placed between a metal inner plate adjacent said lining and a metal outer plate, both plates having a portion contiguous to said stack of sheets, and localized junction means assembling together all of said sheets.

3,966,027

BRAKING APPARATUS FOR STOPPING A ROTATING SHAFT

Howard G. Plitzkow, Faribault, Minn., assignor to Humphrey Elevator and Truck Company, Faribault, Minn.

Filed Apr. 4, 1975, Ser. No. 565,272
Int. Cl.² B60T 7/12
U.S. Cl. 188—182 13 Claims



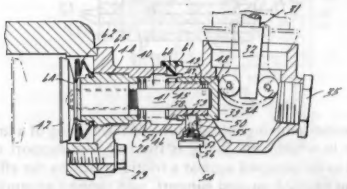
1. Safety braking apparatus for stopping a rotating shaft, said apparatus comprising:
- rigid stop lug means associated with said shaft for rotation thereby;
- displaceable means for selectively engaging said stop lug means; and
- proximity means for electrically actuating said displaceable engaging means at a predetermined angular velocity of said shaft, said proximity means comprising:
  - means for generating an electrical control signal in response to rotation of said stop lug means, and solenoid means for actuating movement of said engaging means into abutment with said stop lug means in response to said control signal, said solenoid means normally operable to hold said displaceable engaging means in a rest position.

3,966,028

AUTOMATIC BRAKE ADJUSTING MECHANISM

Bruce D. Anderson, Berkley, and Alton B. Holmes, Troy, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 7, 1975, Ser. No. 556,486
Int. Cl.² F16D 65/56
U.S. Cl. 188—196 BA 7 Claims



1. A vehicle brake assembly including a support, a movable brake shoe carried by said support, a movable brake actuator and a plunger assembly slidably mounted to said support and operatively connected to transmit motion from said actuator to said brake shoe, said plunger assembly comprising:
- a rod mounted for rotary movement,
- a brake shoe contacting plunger at one end of said rod,
- means for moving said plunger relative to said rod to extend said plunger assembly in response to rotary movement of said rod,
- a member having a rotary driving connection with said rod, said member being mounted for axial movement with said rod during movement of said rod in a brake applying direction and axially movable relative to said rod during return movement of said rod,
- compressible energy storing means biasing said member in the direction of said return movement independantly of said rod, and
- means for rotating said member and said rod upon said biased return movement of said member.

3,966,029

TWO PIECE BRAKE DISC

Raymond G. Spain, 6572 Segovia Circle, Huntington Beach, Calif. 92647

Filed Nov. 29, 1974, Ser. No. 528,383
Int. Cl.² F16D 65/12
U.S. Cl. 188—218 XL 1 Claim

1. A friction disc for use in a brake assembly comprising an outer, generally ring shaped member having an inner edge, an inner, generally ring shaped member disposed generally concentrically within the outer member and having an outer edge disposed against and generally coextensive with the inner edge of the outer member, each of the outer and inner members being essentially an all-carbon composite, one of the outer and inner members comprising a structural member for the disc and the other one of the outer and inner members comprising a wear member having at least one surface defining a frictional wear surface, and cement of essentially all-carbon composition disposed between and bonding the inner edge of the outer member and the outer edge of the inner member together, the inner edge of the outer member and the outer edge of the inner member each having grooves therein, the grooves forming a void therebetween, and the cement of essentially all-carbon composition being disposed within the void.

3,966,030

HYDRAULIC SHOCK ABSORBER FOR VEHICLE SUSPENSION

Jacques Sirven, 87 Boulevard Saint-Michel, Paris, France

Continuation of Ser. No. 408,353, Oct. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 216,627, Jan. 10, 1972, abandoned. This application May 19, 1975, Ser. No. 578,858
Claims priority, application France, Jan. 13, 1971, 71.00893
Int. Cl.² F16F 9/19, 9/34
U.S. Cl. 188—318 10 Claims

1. A telescopic shock absorber comprising
- a cylinder containing a fluid,
- a main piston fixed to a piston rod having a section smaller than that of said cylinder, said main piston being mounted to slide in said cylinder and divide said cylinder into first and second chambers through the second of which chambers said piston rod extends,

first connecting means between said chambers which permits said fluid to flow from said second chamber to said first chamber, but inhibits flow in the opposite direction, and

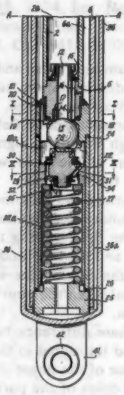
pressure-responsive means for controlling the flow of fluid from said first chamber to said second chamber, said pressure-responsive means comprising

a space,

second connecting means between said space and said second chamber,

valve means having a valve member separating said first chamber from said space, said valve means being subject to the pressure in said first chamber which urges it toward an open position,

additional means adapted to move in said space and having a first surface engaging said valve member and a second opposite surface, said first surface being exposed to the pressure of the fluid in said space and which pressure



urges said additional means toward a position permitting said valve member to open,

a fluid reservoir, said opposite surface being exposed to fluid pressure in said reservoir, flow restricter means in said additional means permitting a restricted flow of fluid directly between said space and said fluid reservoir, said flow restricter means producing an increased pressure in said space upon an increased flow rate into said space from said first chamber,

and resilient means bearing against the opposite surface of said additional means and biasing it against said valve means in a direction which urges said valve means to its closed position, so that the pressure in said first chamber exerted against valve means plus the pressure exerted against the first surface of said additional means acts to counteract the pressure exerted by said resilient means against said additional means and thereby reduces the resistance to fluid flow past said valve means.

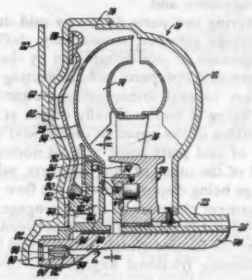
3,966,031

TORQUE CONVERTER AND SLIPPING CLUTCH

Raymond T. Peterson, Jr., Taylor, and Paul D. Stevenson, Ann Arbor, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed June 23, 1975, Ser. No. 589,594
Int. Cl.² F16D *39/00*, *47/06*
U.S. Cl. 192—3.3 **3 Claims**

1. A torque converter and clutch assembly comprising; impeller means; stator means; turbine means in toroidal fluid flow relation with said impeller means and said stator means including a turbine hub having a plurality of radially extending drive lugs and a plurality of support surfaces adjacent the drive lugs at the radially inner end of the drive lugs, a fluid passage formed through said turbine hub having an opening in one of said drive lugs intermediate the radially inner and outer ends thereof, a spacer member rotatably supported on said support surfaces and including complementary radial openings in which said drive lugs are disposed, a bladed turbine element secured to said spacer and having an annular surface adjacent said drive lugs and an aperture in said annular surface adjacent said fluid passage opening in said one drive lug and cooperating therewith to form a variable fluid flow passage, and spring means disposed in drive relation between said spacer and said turbine hub for transmitting drive torque from



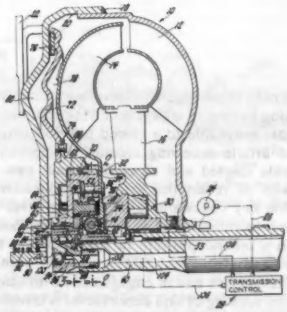
said bladed turbine element to said turbine hub and for permitting relative rotation between said turbine element and said turbine hub to control the opening of the variable fluid flow passage; and clutch means axially slidably disposed on and drivingly connected to said turbine hub and being frictionally slippingly engageable with said impeller means in response to an axial engagement force developed in accordance with fluid flow through said variable fluid flow passage, whereby torque transmission through said torque converter and clutch assembly is split so that a predetermined amount is transmitted through said torque converter and the remainder is transmitted through said clutch means to limit the slip speed between said impeller means and said turbine means.

3,966,032

HYDRODYNAMIC DRIVE AND SLIPPING CLUTCH

Erkki A. Koivunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 9, 1975, Ser. No. 585,238
Int. Cl.² F16D *39/00*
U.S. Cl. 192—3.3 **6 Claims**



3. A drive mechanism comprising:

a rotatable drive member;

a rotatable driven member;

means defining a hydrodynamic coupling between said members;

means defining a friction clutch between said members independent of the hydrodynamic coupling and effective to establish a friction drive between said members in accordance with an engagement force;

means forming a clutch engagement chamber on one side of said friction clutch;

means forming a clutch disengagement chamber on the other side of said friction clutch, said engagement chamber and disengagement chamber being effective to develop a net engagement force on said friction clutch in accordance with hydraulic pressure differential between said chambers; and

means having two parts driven by said drive member and said driven member, respectively, defining a hydraulic fluid passage of size determined by the angular relation between said two parts and connecting said engagement chamber to said disengagement chamber, one of said parts being at least normally driven at a predetermined proportion of the speed of one of said members and the other of said parts being at least normally driven at the speed of the other of said members, said hydraulic fluid passage being disposed to vary the flow of fluid from said engagement chamber to said disengagement chamber to establish a differential pressure between said chambers to engage the friction clutch to the extent required to establish slipping frictional engagement between said members.

3,966,033

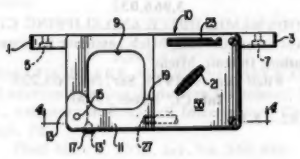
COIN-CHECK OPERATED ARTICLE LOCK

Duncan Doo, 44 Mercer Ave., Englewood, N.J. 07632

Filed Feb. 20, 1975, Ser. No. 551,428

Int. Cl.² G07F *5/00*

U.S. Cl. 194—1 R **9 Claims**



1. A coin check operated article locking device comprising a housing having an article receiving channel therein; a swingable gate moveable to a closed position across the open end of said article receiving channel; reciprocating bolt means moveable toward and away from said gate and engageable therewith to retain the gate in channel closing position; a rockable key check operated latching lever engageable with said bolt to retain same in gate engaging position and moveable to a second position to free said bolt for reciprocating motion away from said gate; a rockable coin operated detent lever having one end in engagement with said bolt at all times whereby rocking of said detent lever is translated into reciprocating motion of said bolt; spring means biasing said detent lever and said latching lever to gate releasing unlatched position.

3,966,034

PHASE SENSITIVE COIN DISCRIMINATION METHOD AND APPARATUS

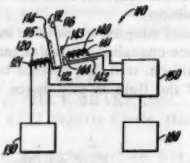
Fred P. Heiman, Delran, N.J., and Guustaaf Arthur Schwippert, Pijnacker, Netherlands, assignors to Mars, Inc., McLean, Va.

Filed Oct. 12, 1973, Ser. No. 405,928

Claims priority, application United Kingdom, Oct. 12, 1972, 47163/72

Int. Cl.² G07F *3/02*

U.S. Cl. 194—100 A **24 Claims**



1. A method for examining coins and identifying conductive coins of a particular denomination, comprising the steps of

generating a high frequency signal,

transmitting an electromagnetic field from a first inductor driven by the high frequency signal,

receiving a portion of the field with a second inductor spaced from the first inductor,

selecting the frequency and location of the inductors relative to the coin under examination so that the amplitude of the part of the field passing through the coin to the second inductor and the amplitude of the part of the field passing around the coin to the second inductor are approximately equal when the coin is a coin of the particular denomination,

determining the phase difference between the signal in the first inductor and the signal in the second inductor, and

comparing the value of the phase difference with predetermined limits for coins of the particular denomination.

3,966,035

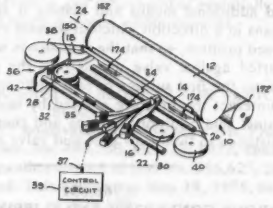
PRINTER

Robert L. Erickson, 1124 - 26th St., Santa Monica, Calif. 90403

Filed Mar. 1, 1974, Ser. No. 447,138

Int. Cl.² B41J *3/10*

U.S. Cl. 197—1 R **9 Claims**



1. In a printer, the improvement of a printing head comprising:

a member of magnetic material having a plurality of apertures forming a plurality of spaced magnetic circuit regions, each circuit region defining a closed magnetic circuit with an air gap;

a plurality of electrical conductor coils, each disposed along one of said magnetic circuits to create a magnetic field in a portion of the member which forms part of the magnetic circuit when the coil is energized;

a plurality of armatures, each moveably mounted along the air gap of one of said magnetic circuits to move in first and second directions wherein the armature moves in directions to respectively close and open the air gap; and

a plurality of printer means individually moveable on said member, each printer means attached to a corresponding one of said armatures for making a mark when a corresponding electrical conductor coil is energized;

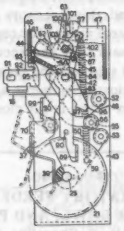
said member being constructed of magnetic material of a type wherein the magnetic field along each magnetic circuit drops to a low level when the corresponding coil is no longer energized.

3,966,036

INKED RIBBON FEED ARRANGEMENT

Francesco Bernardis, Ivrea (Turin), and Dario Bisone, Montalto Dora (Turin), both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Dec. 10, 1974, Ser. No. 531,258
Claims priority, application Italy, Dec. 28, 1973, 70876/73
Int. Cl.² B41J *19/00*
U.S. Cl. 197—82 **21 Claims**



1. An apparatus for feeding an inked ribbon of a highspeed printer for office machines such as accounting machines, terminals, teleprinters or the like, comprising guide means for guiding said inked ribbon along a predetermined path, and feeding means for intermittently feeding a constant stroke of said inked ribbon along said path, said feeding means comprising actuatable advancing means for advancing the inked ribbon along said path, actuatable stopping means for alternately stopping and releasing the inked ribbon, switching means connected to said advancing means and said stopping means and selectively operable for alternately actuating said advancing means and said stopping means, and means defining said constant stroke, said defining means comprising:

lever means cooperative with said inked ribbon to define a loop thereof corresponding to said constant stroke, and movable between a first position and a second position in which said loop is at a minimum size and at a maximum size respectively, said lever means comprising means cooperative with said switching means; and

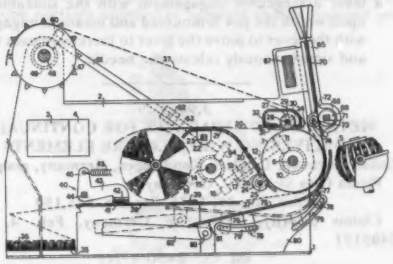
urging means for urging said lever means from said first position to said second position, said cooperative means actuating said switching means in said first and second position of said lever means for the actuation of said advancing and stopping means.

3,966,037

EQUIPMENT FOR HANDLING DIFFERENT FORMS FOR AN ACCOUNTING MACHINE

Adriano Zambolin, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Nov. 20, 1974, Ser. No. 525,740
Claims priority, application Italy, Dec. 3, 1973, 70538/73
Int. Cl.² B41J *15/00*
U.S. Cl. 197—133 R **2 Claims**



1. In an accounting machine an equipment for independently handling a plurality of different forms comprising:

a print and supporting platen for first and second continuous forms positioned adjacent one another on said platen,

a guiding means and advancing means for positioning and feeding a card over said platen in superimposed relationship with at least one of said continuous forms, said guiding means being laterally movable with respect to said platen,

an element movable along said platen for printing on said forms and on said card,

motor means for moving said platen, a second advancing means connected to said motor means for moving said first continuous form, and

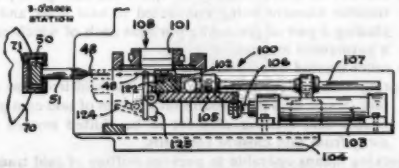
control means for allowing the similtaneous and independent movement of said first continuous form and said card during the printing on said second continuous form.

3,966,038

CONTINUOUS AUTOMATED PLASTIC MOLDING APPARATUS

Wilbert Redmer, Boca Raton; Kenneth Rolin, Del Ray Beach, and Herman Nittel, Boca Raton, all of Fla., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 241,934, April 7, 1972. This application Dec. 13, 1974, Ser. No. 532,558
Int. Cl.² B65G *47/52*
U.S. Cl. 198—20 R **2 Claims**



1. Needle loading apparatus for loading needles into needle supporting means prior to presenting the needle to the mold in a molding machine, said apparatus comprising:

a needle clamp comprising a block having a slot therein adapted for receiving a needle, said slot in the block having a V-shape for receiving a needle in accurate alignment with the needle supporting means, and a reciprocating jaw positioned transverse to said slot at one end of the block for contacting the needle and holding the needle in position while loading the needle in the needle supporting

means, the slot in the block being positioned in alignment with the needle supporting means, said jaw being mounted on a slideable plate for limited movement;

said needle loading apparatus being mounted on a reciprocating plate moveable between a needle clamping position for receiving and clamping the needles and a needle loading position for loading the needles into the needle supporting means;

biasing means arranged for biasing the jaw toward the slot in said block thereby clamping the needle in the slot; and

a lever arranged in engagement with the slideable plate upon which the jaw is mounted and means in engagement with the lever to move the lever to thereby release the jaw and simultaneously release the needle.

3,966,039

METHODS AND APPARATUS FOR CONTINUALLY DELIVERING WIRE CLOSURE ELEMENTS

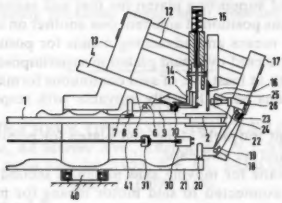
Lubor Kurzweil, Landeck-Kondringen, Germany, assignor to Firma Otto Sick K.G., Germany

Filed Jan. 29, 1975, Ser. No. 545,150

Claims priority, application Germany, Feb. 4, 1974, 2405191

Int. Cl.² B65G 47/42

U.S. Cl. 198—21 **2 Claims**



1. Apparatus for supplying wire closure elements for bottles comprising:

a magazine carrying a row of closure elements at a depositing station;

an endless conveyor traveling adjacent said magazine and having receivers for carrying closure elements from said depositing station toward a bottle wiring station;

a sprocket wheel driven by said conveyor;

a control cam plate rotatably driven by said sprocket wheel and having an irregular surface;

a support;

a lever to said support on a pivot extending generally tangentially to said sprocket wheel;

a guide carried by said support;

a transfer element slidably mounted on said guide, said transfer element being connected to said lever and including a pair of pistonlike portions each of which carry a permanent magnet;

a roller carried by said lever;

spring means biasing said roller against said irregular surface of said cam plate such that rotation of said cam plate causes said transfer element to be shifted toward and away from said closure elements;

locking means operable to prevent shifting of said transfer element toward said closure elements;

first release means for retracting said locking means;

abutment means mounted on said support for movement toward and away from a position in front of said row of closure elements to prevent discharge of closure elements;

second release means for retracting said abutment means;

a hook arm pivotally mounted at said magazine and extending generally radially relative to said sprocket wheel, said arm having:

a first end pressed resiliently against an irregular surface of said sprocket wheel such that said arm is rotated in a predetermined manner in response to rotation of said sprocket wheel, and

a stop end movable between a stop position between the two foremost closure elements of said row of closure elements to allow removal of only one closure element at a time from said magazine, and a release position wherein forward advancement of said row of closures is permitted;

a break gap plate located in the path of travel of said transfer element and disposed above a point where said conveyor receivers arrive;

said break gap plate including an aperture sized to allow passage of said permanent magnets while preventing passage of a closure element carried by said magnets;

fluid circuit sensing means for determining the presence of a yoke closure on a receiver at a sensing station ahead of said depositing station to prevent the depositing of a closure element onto said closure carrying receiver at said depositing station; said sensing means comprising:

a first fluid sensor at said sensing station arranged in the path of a yoke closure which may be carried on said receivers, to detect the presence of such a closure and emit a signal in response thereto,

a rotary stepping disc rotatably mounted and driven for rotation in synchronous relation with said sprocket wheel and said cam plate;

said stepping disc including recessed portions;

second and third fluid sensors arranged to sense said recessed portions and emit a signal in response thereto;

said first, second, and third sensors being operably connected to fluid control means for regulating the supply of actuating fluid to said first and second release means to sequentially retract said locking means and said abutment means to allow a closure element to be deposited onto a receiver only when there is no closure element on said receiver.

3,966,040

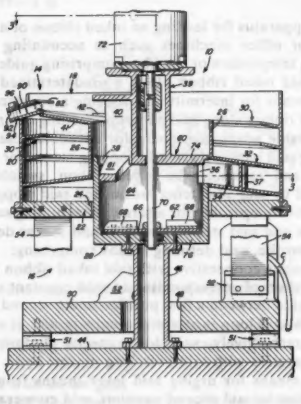
COMBINED VIBRATORY FEEDER DRIVE UNIT, VIBRATORY FEEDER BOWL, AND PARTS SEPARATOR

John E. Hazelwood, R.R. 1, Shoreline Court 110 B, Noblesville, Ind. 46060

Filed Mar. 5, 1975, Ser. No. 555,451

Int. Cl.² B65G 47/42

U.S. Cl. 198—288 **10 Claims**



1. Apparatus for receiving articles such as springs and spring-like parts in bulk and in unoriented and tangled condi-

tion and untangling and orienting same, the apparatus comprising, in combination:

a. a parts separator assembly arranged for receiving tangled articles and separating same:

b. a hopper arranged for orienting separated parts received from the separator assembly, the separator assembly being arranged centrally of and within the hopper; and

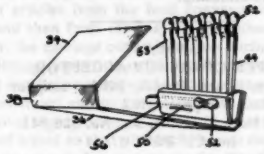
c. a vibratory feeder drive unit connected to the hopper for imparting vibrations to the hopper and feeding parts received from the separator assembly; the hopper is an annular bowl which includes an outer wall and a bottom, the latter being provided with a central opening, and further including an inner wall arranged around and spaced from the opening, the outer and inner walls extending co-directionally from the bottom, the separator assembly including a separator unit arranged in the central opening of the bottom of the bowl, and the bowl further includes a spiral track extending toward the inner wall of the bowl from the outer wall of the bowl, a portion of the track adjacent the bottom of the bowl extending from the outer wall to the inner wall and spiralling more than one revolution around the bowl and forming a pocket, and the separator unit having a discharge port disposed in communication with the pocket for decelerating parts emitted from the separator unit without the parts striking parts already in the bowl and becoming entangled again.

3,966,041

SAFETY MATCHBOOK

John Burgess, 1336 N. Occidental Blvd., Los Angeles, Calif. 90026, and Don Byrd, 1429 Greenwood Ave., Montebello, Calif. 90640

Filed Jan. 27, 1975, Ser. No. 544,206
Int. Cl.² A24F *27/18, 27/00, 27/12*
U.S. Cl. 206—108 **7 Claims**



1. A matchbook comprising a cover; a plurality of matches, said matches being retained by said cover, a striking surface, said striking surface being enclosed within a chamber having at least one open end formed in said cover, and an aperture disposed along one side of said chamber which aperture communicates with the interior of said chamber such that the end of one of said matches opposite the match head may be inserted into said aperture and withdrawn from said open end thereby contacting said match head with said striking surface.

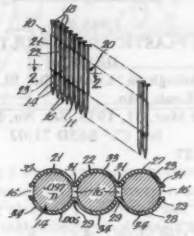
3,966,042

FASTENER STRIP

Lawrence S. Shelton, Morton Grove; Rudolf A. M. Golsch, Mount Prospect, and Dieter G. Boigk, Skokie, all of Ill., assignors to Signode Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 354,313, April 25, 1973, abandoned. This application July 7, 1975, Ser. No. 593,538
Int. Cl.² B65D *85/24*
U.S. Cl. 206—344 **10 Claims**

1. A strip of fasteners for use in a rapid-acting fastener driving apparatus, comprising: a plurality of metal fasteners having elongated cylindrical shanks disposed in close generally parallel relationship to define a gap between adjacent shanks, and carrier means for connecting said fasteners to form said strip, said carrier means including a plurality of single-component, metal-adherent plastic envelopes extending about a major portion of each half of said shanks and having the properties of an adhesive bond without requiring a separate adhesive, each of said envelopes being of uniform thickness and having a pair of opposed portions each adhering respectively to opposite sections of the circumference of each shank during the entire driving action including entry into the workpiece, the carrier means between said envelopes extending into said adjacent gaps and defining therein between the envelope portions adhered to adjacent shanks recessed por-



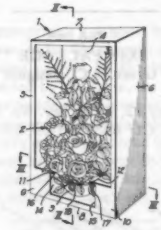
tions directed inwardly toward similar recessed portions between envelope portions secured to the opposite portions of the shanks, the bonding properties of the carrier means being such that the resistance to shear at the interface between the carrier and shank is greater than the shear resistance of the carrier material in the gap between two adjacent fasteners and greater than the resistance of the workpiece encountered when the fastener and carrier material penetrate same, thereby securing said fasteners together into said fastener strip while permitting each respective envelope and fastener to be easily and cleanly sheared and driven into said workpiece.

3,966,043

PACKAGE FOR FLORAL ART PIECES

Leo Guillaume Devroe, Edegem, Belgium, assignor to Antwerp Plastic Merchandising, Antwerp, Belgium

Filed July 22, 1974, Ser. No. 490,245
Claims priority, application Belgium, Apr. 30, 1974, 53581
Int. Cl.² B65D *25/10, 85/52*
U.S. Cl. 206—423 **1 Claim**



1. A package for a support having a peripheral edge and an article projecting from said support, such as a pot containing a floral art piece, comprising:

a unitary open box having a back wall, two side walls, a top wall and a bottom wall, said side walls having inwardly directed opposed flange-like members having spaced apart inner edges and dividing said box into a lower compartment for said support and an upper compartment for said article,

said spaced edges and the inner surfaces of the portions of said side walls below said members converging from the

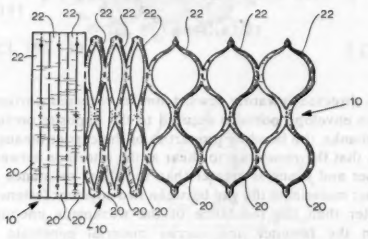
front of said package toward said back wall and at least one of the inner surface of said bottom wall and lower surfaces of said members sloping toward said back wall whereby the height of said lower compartment adjacent said back wall is less than that at the front of the package, said support being positioned in said lower compartment and at least a portion thereof wedgingly received between said botttom wall and the lower surfaces of said members, and a further flange-like member extending forwardly from said back wall and connecting the rear portions of said spaced inner edges.

3,966,044

SCRAPLESS PLASTIC SHEET MULTI-PACKAGING DEVICE

Ernest Ray Cunningham, Libertyville, Ill., assignor to Grip-Pak, Inc., St. Louis, Mo.

Filed Mar. 31, 1975, Ser. No. 563,885
Int. Cl.² B65D 71/02
U.S. Cl. 206—427 **5 Claims**



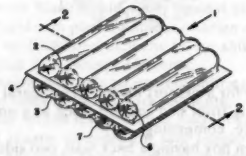
1. A scrapless multi-packaging device for a plurality of containers or the like, said multi-packaging device being made from a stretchable and elastic sheet of plastic material and including a plurality of laterally connected pairs of flat sheet material bands arranged in longitudinal rows, adjacent sheet material bands in each said longitudinal row being longitudinally connected to one another, each of the lateral and longitudinal connections being creased along the lateral extent of said connections in opposite alternating directions to one another whereby longitudinal stretching of said sheet causes said sheet material bands to automatically open and assume a generally upstanding condition for assembly to containers.

3,966,045

SKIN PACKAGE

Richard R. Perdue, Greer, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed May 12, 1975, Ser. No. 576,411
Int. Cl.² B65D 73/00, 85/20
U.S. Cl. 206—443 **12 Claims**



1. A skin package comprising:

a. a gas impervious support member and two film members; and,

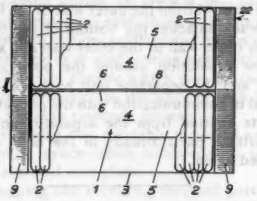
b. products held securely to opposed sides of said support member, each product being held solely by a respective film member which includes a portion which conforms to the exact shape of the product, each of said film members being sealed to said support member around the periphery of each respective product.

3,966,046

WRAPPER ASSEMBLY INCLUDING AN ARTICLE CARRIER ELEMENT

Gert Deutschländer, Neuhausen am Rheinfall, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Mar. 5, 1975, Ser. No. 555,457
Claims priority, application Switzerland, Mar. 5, 1974, 3122/74
Int. Cl.² B65D 85/62
U.S. Cl. 206—445 **4 Claims**



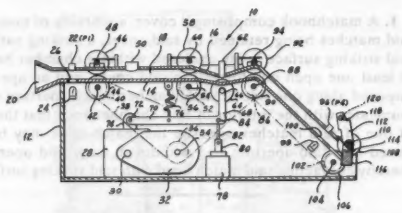
1. A wrapper assembly for packaging articles, including a carrier element supporting the articles and a sleeve surrounding the carrier element and the articles, the improvement wherein said carrier element is a one-piece member constituted of a folded blank having the shape of a rectangle; said carrier element comprising two compartments, each formed of a separate bottom wall, a separate lateral wall and at least one separate end wall, the two lateral walls being in a face-to-face contacting relationship.

3,966,047

PAPER CURRENCY ACCEPTOR

Larry E. Steiner, Grand Rapids, Mich., assignor to Rowe International Inc., Whippany, N.J.

Filed Nov. 27, 1974, Ser. No. 526,941
Int. Cl.² B07C 5/344
U.S. Cl. 209—75 **14 Claims**



1. A bill acceptor for rejecting a spurious bill having magnetic material in an area where genuine bills are printed with nonmagnetic ink and including in combination a high resolution magnetic sensing head, means including said sensing head for scanning the bill along a path traversing said area, means for producing a signal concurrent with the traversal of said area by the sensing head, said head providing an output pulse for each transition from a nonmagnetic region of the bill to a magnetic region thereof, and means responsive to the concomitant presence of said signal and a single output pulse from the magnetic sensing head for rejecting the bill.

3,966,048

INSPECTION OF GLASS ARTICLES

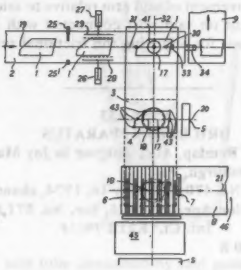
Emmanuel Nunés, Ribecourt, and Jacques Vervin, Thourotte, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed July 21, 1975, Ser. No. 597,911

Claims priority, application France, July 19, 1974, 74.25137

Int. Cl.² B07C 5/04

U.S. Cl. 209—82 14 Claims



1. Automatic inspection apparatus for inspecting glass articles, which comprises an inspection station comprising a reference jig, measuring means at the inspection station for comparing at least one dimension of an article with a corresponding dimension of the jig, the measuring means being capable of emitting a signal when the difference between the dimension of the article and the reference dimension exceeds a predetermined value, horizontal feed conveyor means for feeding a succession of articles to be inspected, horizontal removal conveyor means for removing the articles after inspection, a carriage movable to and fro between abutments to transport articles from the feed conveyor to the inspection station and then from the inspection station to the removal conveyor, the carriage comprising two seizing means for seizing and lifting respective articles from the feed conveyor and jig at the inspection station when the carriage is at one end of its path of travel and to drop respective articles onto the jig and removal conveyor when the carriage is at the other end of its path of travel so that an article is successively lifted from the feed conveyor, dropped on the jig, lifted from the jig and dropped on the removal conveyor, the seizing means each comprising a downwardly directed orifice surrounded by a flexible lip having a maximum width less than the minimum dimension of the article to be seized, aspiration means for aspirating a stream of air upwardly through the orifice to attach the article to be seized thereto by suction, a duct through which the aspirated air is drawn and a valve arranged to open and shut the duct to start and stop the stream of air, and means sensitive to the position of the carriage to open and shut the duct, and rejection means for removing reject articles in response to said signal.

3,966,049

APPARATUS FOR SORTING EGGS AS TO WEIGHT

Christiaan van den Berg, Nunspeet, Netherlands, assignor to Big Dutchman (International) A.G., Chur, Switzerland

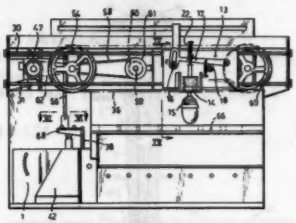
Filed Nov. 15, 1974, Ser. No. 524,221

Claims priority, application Netherlands, Nov. 15, 1976, 7315648

Int. Cl.² B07C 5/16; A01K 43/08

U.S. Cl. 209—121 15 Claims

1. In an egg sorting apparatus responsive to the weight of the eggs having an egg receiver, a weighing means having an egg carrier, a power driven conveyor for transporting a weighed egg, an ejector for ejecting a weighed egg from said conveyor and a collector of weighed eggs, the improvement comprising: an electronic weighing means having a vertically moveable lifting frame coupled with said egg receiver and cooperating with said egg carrier, said lifting frame being interconnected with a lifting arm which is synchronously moveable with said power driven conveyor, said power driven



conveyor including a frame and being horizontally moveable to and fro, drive means for said conveyor, said drive means including a linking element for moving said conveyor along said egg collector, said collector including a suction cup controlled by a pair of vacuum bellows to receive an egg, said suction cup cooperating synchronously with said egg carrier.

3,966,050

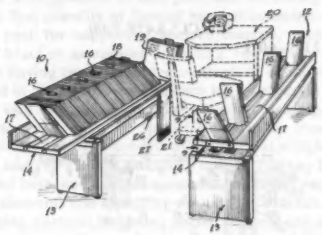
INDEX FILE

Robert M. Dahl, 633 Park St., Wilmette, Ill. 60091

Filed Mar. 31, 1975, Ser. No. 563,786

Int. Cl.² A47B 57/00

U.S. Cl. 211—10 7 Claims



1. An index file comprising a support base, a table shiftably mounted on said base, index file support means carried by the table, base rail means carried by the base, complementary table rail means carried by the table, the base rail means and table rail means having identical cross-sectional shapes, antifriction ball means interposed between said base and table rail means, and a vertically extending brake lever depending from said support base and having a lower foot operative portion, said brake lever releasably locking the table in various positions of adjustment relative to the base.

3,966,051

FREE-STANDING GOLF CLUB AND GOLF BALL CARRIER

Ralph O. Hollister, 2634 49th Ave. Court, and Ernest E. Sanders, 1313 10th St., both of Greeley, Colo. 80631

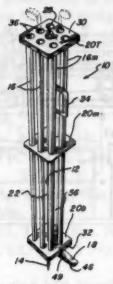
Filed Apr. 10, 1975, Ser. No. 566,723

Int. Cl.² A63B 55/02

U.S. Cl. 211—14 4 Claims

1. In a carrier for both golf clubs and golf balls: a pair of elongate springable tubular elements having the interior thereof sized to loosely receive the shaft of a golf club, a third elongate element, and means fastened to said third element and said pair of tubular elements fastening them together in

spaced parallel relation to one another while cooperating therewith to define a cage-like compartment closed at both ends and sized to retain a plurality of golf balls stacked one atop another, said pair of tubular elements being held in



spaced relation such that the normal gap separating them is less than the diameter of a golf ball, and said tubular elements being spreadable to the extent necessary to pass a golf ball therebetween.

3,966,052

ARRANGEMENT FOR KEEPING TOOLS OF THE DRILLING, MILLING, BORING TYPE ETC. IN READINESS FOR USE ON MACHINE TOOLS

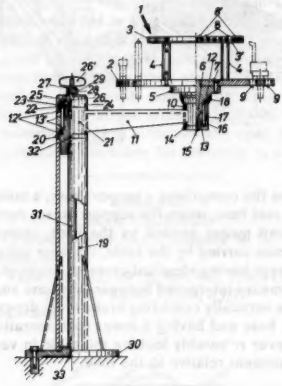
Reto Knaus, Ueberlandstrasse 309, 8051 Zurich, Switzerland

Filed May 15, 1974, Ser. No. 470,079

Claims priority, application Switzerland, Feb. 4, 1974, 1594/74

Int. Cl.² A47F 7/00

U.S. Cl. 211—60 T **4 Claims**



1. A tool holder for shank tools comprising:

a table having a horizontal large-diameter lower disk, and a small-diameter upper disk spaced above and coaxial with said lower disk, and spacer means interconnecting said disks for joint rotation in spaced-apart relation, said upper disk being formed with a rectangular array of holes each adapted to receive a tool shank, said lower disk being formed with at least one circular array of holes outwardly of the outline of said upper disk and adapted to receive tool shanks;

a flanged shaft having its flange connected to the underside of said lower disk and extending coaxially with said table;

a support sleeve rotatably receiving said shaft;

friction means between said sleeve and said shaft for retarding rotation of said shaft relative to said sleeve;

a base;

a tubular post mounted on said base;

a horizontal arm rotatable on said post and carrying said sleeve;

a tubular pivot in said post carrying said arm;

a rod extending through said post and interconnecting said pivot and said base;

further friction means on said post for frictionally retarding swinging movement of said arm relative to said post; and

adjusting means on said post connected with said further friction means for adjusting the frictional retardation of said arm.

3,966,053

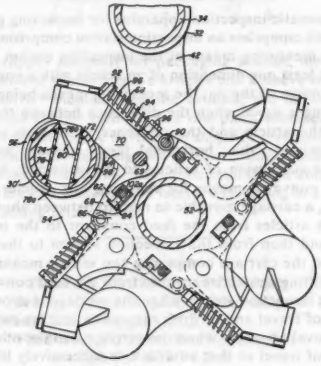
DRILLING APPARATUS

James B. Loftis, Remlap, Ala., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Division of Ser. No. 470,577, May 16, 1974, abandoned. This application Apr. 25, 1975, Ser. No. 571,854

Int. Cl.² E21B 19/14

U.S. Cl. 211—60 S **8 Claims**



7. A drill pipe storage rack comprising: plurality of drill pipe support means, each of said support means including an upper drill pipe supporting assembly adapted to support an upper end portion of a drill pipe, a lower drill pipe supporting assembly adapted to support a lower end portion of such drill pipe and an actuator means; each of said lower drill pipe supporting assemblies including latch means movable in a generally horizontal plane into a drill pipe contacting position in response to a portion of a respective one of said actuator means being moved into a first position and said latch means movable in said plane into a drill pipe non-contacting position in response to movement of said portion being moved into a second position.

3,966,054

SHOCK ABSORBER FOR TUBULAR STORAGE OR DRILL STANDS ON A DRILLING SHIP

Robert R. Kelly, Hoffman Estates, Ill., assignor to BJ-Hughes Inc., Long Beach, Calif.

Filed May 22, 1975, Ser. No. 579,985

Int. Cl.² A47F 7/00

U.S. Cl. 211—60 S **3 Claims**

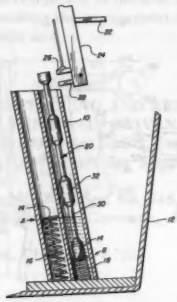
1. Pipe racking apparatus which comprises:

at least one closed bottom racking tube;

a piston in said tube having an area less than the surface area of a plane transverse to said tube;

said piston being contacted by pipe upon racking and storage in said tube;

a coil spring urging said piston upwardly in said racking tube to a pipe receiving position;



a fluid in said tube contained by said piston;

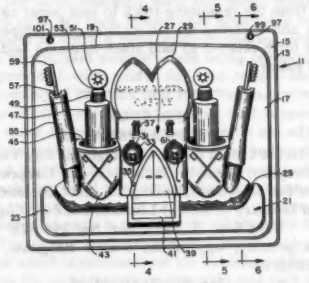
whereupon energy from impact upon said piston by a pipe being racked is dissipated in said fluid which piston moves downwardly in said racking tube, said piston being urged to move upwardly in said tube by said spring upon removal of said pipe therefrom.

3,966,055

DISPLAY HOLDER FOR DENTAL MATERIALS

Vincent J. Francavilla, 140 Kenmore Ave., Buffalo, N.Y. 14226

Filed June 14, 1974, Ser. No. 479,276
Int. Cl.² A47B *81/02*
U.S. Cl. 211—65 **6 Claims**



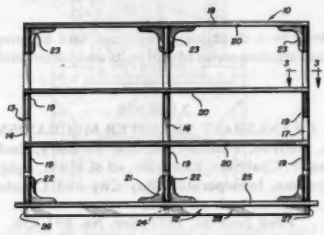
1. A display holder, adapted to be held vertically in use, holding and displaying a toothbrush, a container of dentifrice and a dispenser of dental floss at particular indicated locations therein, which comprises a pair of unitary synthetic organic polymeric plastic three-dimensional front and back members of vacuum formed sheet material of a thickness between **5** and **50** mils, inclusive, each of said members having first areas which conform with and contact similar areas on the other member, said members being fastened together at said first areas so as to rigidify the display holder, said members having second areas which are spaced from each other and form compartments therein between them for at least the toothbrush and container of dentifrice, which compartment for the dentifrice supports the container thereof resting on its bottom, the front member having a scene depicted thereon including a representation of a fighter against tooth decay and a weapon for use in such fight wherein the container of dentifrice participates and represents at least a part of said fighter against tooth decay and the toothbrush participates and represents at least a part of said weapon when the container of dentifrice and toothbrush are held in the display holder at their particular indicated locations.

3,966,056

ARTICLE SUPPORT DEVICE

Charles O. Larson, Sterling, Ill., assignor to Charles O. Larson Co., Sterling, Ill.

Filed Mar. 19, 1975, Ser. No. 559,634
Int. Cl.² A47F *5/00*
U.S. Cl. 211—134 **8 Claims**



1. An article support device, comprising: a base; a frame extending from said base, said frame having at least two spaced apart posts and a rail of substantially the same cross-sectional configuration as said posts and extending therebetween, a first plurality of flanged bracket assemblies secured to said post for supporting shelves thereon, each of said flanged bracket assemblies including two similar flanged brackets having two straight leg elements of equal length and L-shaped in their plan view and each leg L-shaped in its cross-section, said two similar bracket elements being positioned relative to one another to form a U-shape in the cross-section with said two bracket elements overlapping at a bight portion thereof, and two flanges extending outwardly away from said frame and base, and circular apertures formed in each of said bracket elements and extending through the bracket elements overlapping portions but being displaced from one another a distance substantially equal to the flange material thickness to permit insertion of a fastener therethrough and to locate the fastener with its head adjacent the U-shaped bight portion and between the bracket flanges, whereby the fastener is at least partially hidden.

3,966,057

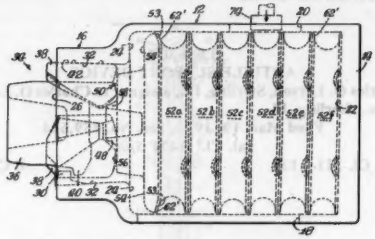
DRAFT GEAR MECHANISM AND METHOD OF ASSEMBLING SAME

Francis H. Duquette, Hinsdale, and Walter H. Merker, Jr., Downers Grove, both of Ill., assignors to Miner Enterprises, Inc., Chicago, Ill.

Filed Feb. 6, 1975, Ser. No. 547,692
Int. Cl.² B60G *9/06*
U.S. Cl. 213—22 **11 Claims**

1. A draft gear mechanism comprising an integral casing having a main body portion and a rear end closure wall and a constructed front end section, force transmitting means within and projecting from said front end section, a front pad follower within said body portion and abutting said force transmitting means, a stacked series of individual compressible elastomeric resilient pad units within said body portion between said front pad follower and said rear end closure wall, and an opening formed in one side wall of said body portion through which a compressed group of said pad units may be

moved into said body portion during assembly of said mechanism, the inner surface of said rear end closure wall having a



slight slope in a direction away from said opening thereby urging said stacked series of pad units away from said opening.

3,966,058

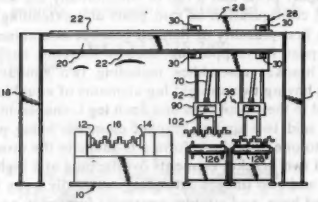
CRANKSHAFT TRANSFER MECHANISM

Allan J. Heffron, Freeland; Arthur L. Estry, Jackson, and William F. Chalmers, Essexville, all of Mich., assignors to C. M. Systems, Incorporated, Bay City and Crankshaft Machine, Jackson, both of, Mich.

Filed June 30, 1975, Ser. No. 591,436

Int. Cl.² B65G *25/00*

U.S. Cl. 214—1 BB **9 Claims**



1. Crankshaft transfer apparatus comprising, in combination, an elevated track having parallel guide surfaces defined thereon, a carriage mounted upon said track for movement thereon, a first drive motor mounted upon said carriage drivingly connected to said track for translating said carriage upon said track, vertically oriented crankshaft holder guide means affixed to said carriage, a crankshaft holder mounted upon said guide means movable in a vertical direction with respect to said carriage, said holder including a movable jaw pivotally mounted thereon, a horizontally disposed drive shaft rotatably mounted on said carriage, a second drive motor mounted on said carriage in driving connection with said drive shaft, a holder drive pin eccentrically mounted on said drive shaft, connecting means connecting said pin to said crankshaft holder whereby rotation of said drive shaft alternately raises and lowers said holder, jaw actuating means mounted in said holder for vertical movement with respect thereto connected to said movable jaw, such relative vertical movement actuating said jaw between crankshaft holding and release positions, a slide mounted upon said pin for radial movement relative to the axis of rotation of said drive shaft, means connecting said slide to said jaw actuating means, cam means mounted on said carriage, and a cam follower connected to said slide engaging said cam means radially positioning said slide in accord with the contour of said cam to produce predetermined operation of said jaw in accord with the rotational position of said drive shaft.

3,966,059

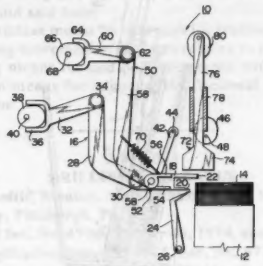
PAPER FEEDING APPARATUS FOR AN AUTOMATIC PLANE TYPE PAPER PUNCHING MACHINE

Eizo Sase, No, 1991 Daikan-cho, Tatebayashi, Gunma, Japan

Filed Oct. 3, 1974, Ser. No. 511,731

Int. Cl.² B65G *59/02*

U.S. Cl. 214—8.5 SS **8 Claims**



1. A paper feeding apparatus for an automatic plane type paper punching machine comprising a punching unit to punch stacked sheets of paper so as to obtain a predetermined shape and size of said stacked sheets of paper and a paper catcher to receive from said paper feeding apparatus and catch and deliver to said punching unit said stacked sheets of paper to be punched, said paper feeding apparatus comprising a base to mount thereon a stack of sheets of paper; separator means to separate predetermined sheets of paper from said stack, said separator means including an arm member movable back and forth relative to said stack and a pawl member means mounted on said arm member at one end thereof to be inserted into the layers of said stack at a first level means mounted on the separator and operatively associated with a fixed means for rising said predetermined sheets of paper to a second level; means to clamp and carry said separated sheets of paper from the remaining stack to said paper catcher, said clamping and carrying means including a clamper movable back and forth relative to said stack to clamp said separated sheets of paper.

3,966,060

LIFTING APPARATUS

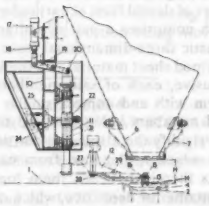
John Frederick Collett Andrews, Lingfield; Roy Victor Beton, West Drayton; Kenneth David Leavens, Carpenders Park, and Gordon John Scott, Bovingdon, all of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Sept. 5, 1973, Ser. No. 394,528

Claims priority, application United Kingdom, Sept. 15, 1972, 42890/72

Int. Cl.² B66C *13/00*

U.S. Cl. 214—35 R **8 Claims**



1. Lifting apparatus for lifting and lowering an object comprising an arm having at one end a pivot, engagement means

including a bar mounted on the pivot with prongs fixed on the bar and projecting downward from the bar adapted to engage with the object, a drive shaft for the arm connected adjacent the other end of the arm, lifting and lowering means connected with the drive shaft for lifting and lowering the drive shaft and the arm, first rotating means separately connected to the drive shaft for rotating the drive shaft and the arm, and second rotating means connected to the arm and engagement means for relatively rotating the engagement means about the pivot with respect to the arm.

3,966,061

APPARATUS FOR INSTALLING AND REMOVING THE DRIVE ASSEMBLY IN CHAIN DRIVEN-VEHICLES

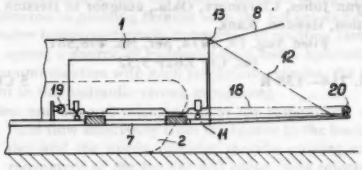
Berthold Fehn, Lintorf, and Oskar Simon, Essen, both of Germany, assignors to Gesellschaft fur Systemtechnik mbH, Dusseldorf, Germany

Filed Jan. 30, 1975, Ser. No. 545,714

Claims priority, application Germany, Feb. 11, 1974, 2406330

Int. Cl.² B65G 67/02

U.S. Cl. 214—38 D **1 Claim**



1. Apparatus for installing and removing the drive assembly of a chain-drive vehicle having an opening at its rear and provided with a cradle and a chain drive mechanism, comprising: giuide means disposed in the interior of the cradle; means composed of rollers arranged to engage on said guide means for lifting the drive assembly onto said guide means; means defining an auxiliary rack temporarily attachable to the rear of the vehicle to form a rearwardly-projecting extension of said guide means, said auxiliary rack being composed of two supports provided with guides for said rollers and a cross member connected between said supports; mounting devices at the rear of the vehicle for fastening said supports to the vehicle at those ends of said supports which are adjacent the vehicle when said rack is temporarily attached to form such extension; a suspension device carried at the rear of the vehicle and including load supporting elements arranged to be connected to that end of said rack which is remote from the vehicle when said rack is temporarily attached to form such extension for supporting the entire load presented by such end of said rack which is remote from the vehicle and by the drive assembly on the rack, thereby to maintain said rack stationary relative to the vehicle; and means for moving the drive assembly through the opening in the rear of the vehicle onto the auxiliary rack.

3,966,062

APPARATUS FOR CHARGING RAW MATERIALS INTO BLAST FURNACES

Kiyotoshi Sakai, 3-503, 12, Tenjin 1-chome, Tobata, Kita-kyushu, Fukuoka, Japan

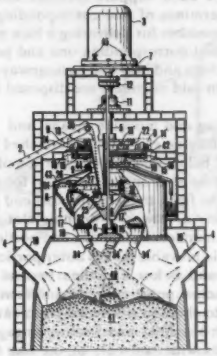
Filed Apr. 9, 1975, Ser. No. 566,441

Claims priority, application Japan, Apr. 15, 1974, 49-43068

Int. Cl.² F27B 1/20

U.S. Cl. 214—35 R **8 Claims**

1. Raw material charging apparatus for a blast furnace comprising a hollow inverted frustum shaped rotary hopper, conveyor means for supplying raw materials into said rotary hopper, a hollow disc shaped impeller disposed beneath said rotary hopper, said impeller including a dish shaped central portion facing to the lower end of said rotary hopper and a plurality of vanes mounted on the periphery of said dish shaped central portion for defining a plurality of discharge openings between adjacent vanes, for throwing out the raw materials by centrifugal force, a stationary inclined chute



means including an annular hopper surrounding said impeller for charging the raw materials discharged by said vanes into the top of said blast furnace, a cover for said impeller and a lid for the said inclined chute means, said lid encircling said cover with an annular gap therebetween, and means for ejecting inert gas into said annular gap for preventing the gas in said blast furnace from leaking to the outside.

3,966,063

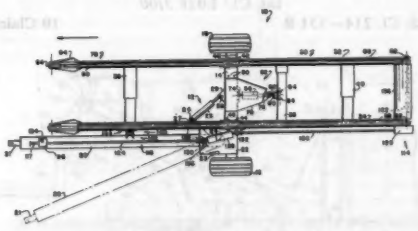
LARGE ROUND BALE HANDLING APPARATUS

Willis R. Campbell, Ephrata; Thomas W. Waldrop, and Shaun A. Seymour, both of New Holland, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Dec. 5, 1974, Ser. No. 529,982

Int. Cl.³ B60P 1/38

U.S. Cl. 214—83.36 **6 Claims**



1. An apparatus for handling crop material packages, such as large round bales or the like, comprising:

a mobile frame adapted for movement across a field;

a bed assembly including a pair of elongated support members being mounted at generally similar locations between their opposite ends to said frame such that said members longitudinally extend generally in the direction of movement of said mobile frame, each of said members being laterally spaced apart from the other and throughout a substantial portion of its longitudinal extent defining therebetween an elongated generally unobstructed channel or passageway within which the lower cylindrical portion of a bale or the like may downwardly extend when said bale is received and supported along said mem-

bers with its longitudinal axis extending generally parallel to said members, said bed assembly capable of being disposed in an inclined position with respect to the field in which corresponding one end portions of said support members are disposed adjacent the field;

separate means movably mounted on and along each support member and having outer portions disposed for movement along a path extending along and above an upper side of each support member and around and beyond the terminus of said corresponding one end portion of each member for delivering a bale or the like from the field to said corresponding one end portions of said support members and into said passageway defined therebetween when said members are disposed in the inclined position;

means for driving said movable means; and

a separate ground engaging element attached to and extending along and below said one end portion of each member so as to underlie said one end portion for supporting the same above the field, the forwardmost end portion of said element having a forwardly-opening slot defined therethrough which underlies said one end portion for allowing passage of said movable means outer portions as the same move along and below and then beyond said one end portion of each support member and toward said terminus thereof to thereby insure engagement of said outer portions with the field and leading engagement of said outer portions with said bale or the like for facilitating insertion of said member end portions under said bale or the like and receipt of the same into said passageway defined between said members as said apparatus is moved across the field in the direction of said bale or the like, said each element also including an elongated flat base portion underlying said member end portion and being disposed rearwardly of said slotted forwardmost end portion of flush with the surface of the field for sliding contact therewith when said support members are disposed in said inclined position and said apparatus is moved across the field.

3,966,064

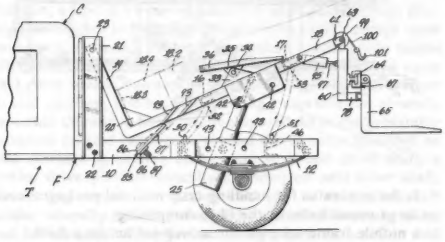
MULTI-PURPOSE VEHICLE

John Phil Felburn, 1700 Asheville Highway, P.O. Box 747, Hendersonville, N.C. 28739

Continuation-in-part of Ser. No. 284,654, Aug. 29, 1972, abandoned. This application Sept. 16, 1974, Ser. No. 506,517

Int. Cl.² E02F *3/00*

U.S. Cl. 214—131 R **10 Claims**



1. A roadway tractor for towing a semi-trailer having the usual fifth wheel plate, said tractor including a horizontal frame and wheels connected to and supporting the frame from a roadway, the improvement comprising:

upright support means having its lower end connected to a forward part of said frame and its upper end disposed a considerable distance above said frame,

a sub-frame having a first portion carrying a fifth wheel for engagement with said fifth wheel plate, said first portion being normally horizontal in juxtaposition to said frame,

said sub-frame also having an upright second portion rigidly connected to said first portion with its upper end pivoted to the upper end of said support means,

whereby said sub-frame may be swung about the pivot to elevate its normally horizontal first portion and in so doing causing the rear part of said first portion and said fifth wheel to move in a direction rearwardly of said frame,

means for effecting pivotal movement of said sub-frame,

said frame including a pair of laterally spaced longitudinally extending beams,

said sub-frame first portion including a pair of beams longitudinally aligned with said frame beams and resting thereon in normally horizontal position,

and metal side plate secured to each beam of said sub-frame first portion and depending therefrom, each plate cooperating with a side portion of a respective frame beam to maintain longitudinal alignment of said frame and sub-frame in horizontal position.

3,966,065

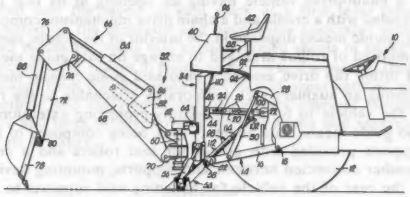
SAFETY HOLD-DOWN APPARATUS FOR TRACTOR-MOUNTED EARTH WORKING IMPLEMENTS

Joel Flynn Jones, Claremore, Okla., assignor to Hesston Corporation, Hesston, Kans.

Filed Aug. 19, 1974, Ser. No. 498,581

Int. Cl.² E02F *3/32*

U.S. Cl. 214—138 R **5 Claims**



1. In earth-working equipment:

a prime mover having a vertically swingable hitch and singleacting, fluid-pressure lifting means for raising said hitch,

said lifting means being operable to exert against the hitch an upward force only;

an implement mounted on said hitch for movement therewith when the hitch is raised and lowered,

said implement including a frame, a tool shiftably carried by the frame, and first fluid-pressure power means between the frame and the tool for actuating the tool; and

apparatus for applying a counteracting hold-down force against the implement during working resistance encountered by the tool,

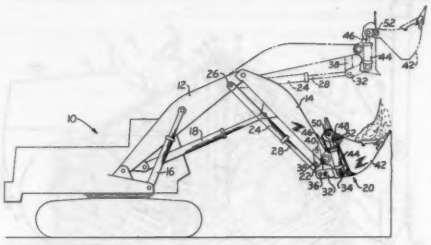
said apparatus including second single-acting, fluid-pressure power means disposed to transmit force between the prime mover and the implement and operable to exert against the implement a downward force only,

said second power means being coupled in constant fluid communication with said first power means during actuation of the latter for responding with increased hold-down force to pressure build-up in said first power means.

3,966,066
HYDRAULIC CIRCUIT

Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 25, 1975, Ser. No. 571,873
Int. Cl.² E02F 3/40
U.S. Cl. 214—146 R 7 Claims



1. In a bottom dump front shovel machine having a bucket and apron and independent hydraulic cylinders respectively connected therewith to control the respective movement of the bucket and apron, the bucket cylinder being operatively connected in pivoting fashion with the bucket and the apron cylinder being operatively connected in pivoting fashion with the apron, a source of hydraulic fluid and a hydraulic circuit in communication with each respective cylinder, the improvement in the hydraulic circuit comprising:

first and second selector valves for respectively directing fluid flow selectively from the source to the bucket cylinder and the apron cylinder thereby causing respective movement of the bucket and apron, said selector valves being operatively positioned in response to first and second actuation means;

said first selector valve being operatively connected with each end of the bucket cylinder and providing communication between the source and the bucket cylinder to direct flow to one end of the bucket cylinder depending on the operative position of said first selector valve;

said second selector valve being operatively connected with each end of the apron cylinder and providing communication between the source and the apron cylinder to direct flow to one end of the apron cylinder depending on the operative position of said second selector valve; and

a control valve having a conducting and a nonconducting flow position, said control valve being connected in parallel between respectively one ends of the bucket and apron cylinders, said control valve being responsive to the actuation means for movement of said first selector valve in one direction wherein, when said first and second selector valves and said control valve are actuated, a portion of the flow from the bucket cylinder circuit is diverted through said control valve to the apron cylinder circuit thereby permitting simultaneous bucket and apron movement.

3,966,067
DISPOSAL VEHICLE

Raymond E. Reese, Los Angeles, Calif., assignor to Frodsham, E. Dale, Yorba Linda, Calif.

Filed July 24, 1974, Ser. No. 491,199
Int. Cl.² B65F 3/02
U.S. Cl. 214—302 9 Claims

1. A dual-function vehicle-loading apparatus, comprising:

a vehicle;

a lifting mechanism mounted on, and adapted to move relative to, said vehicle;

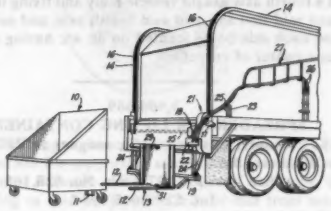
said lifting mechanism having:

a lifting framework;

a lifting fork having a pair of outwardly extending L-shaped pallet-type tines fixed to said lifting framework;

whereby said tines of said lifting fork may be engaged with respective lifting channels of a pallet-type structure on a container adapted to be lifted by said lifting mechanism, and have its contents dumped into said vehicle;

said lifting framework having a loading opening defined at the sides by the vertical legs of said tines and at the top and bottom by members of the lifting framework, said opening adapted to provide communication between the

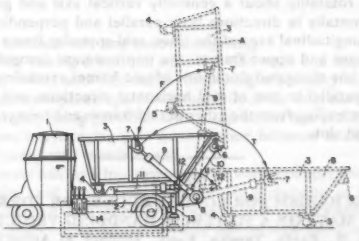


volume above said tines and the body of said vehicle when said lifting framework has been raised to a suitable level, a lifting platform adapted to fit onto said lifting framework adjacent said loading opening and extending between and co-planar with the vertical and horizontal legs of the pair of tines, respectively, when in the vertical or horizontal position; and cooperating means for holding said platform in an operative state relative to said lifting framework.

3,966,068
POWERED VEHICLE WITH CONTROLS FOR LOADING, UNLOADING AND DISCHARGE TILTING OF A SEPARABLE CONTAINER

Orazio Duvia, Via Carducci, 19100 La Spezia, Italy

Filed July 12, 1974, Ser. No. 488,008
Claims priority, application Italy, Sept. 27, 1973, 16706/73
Int. Cl.² B65G 65/04
U.S. Cl. 214—317 8 Claims



1. A material handling device, comprising: a wheeled, self-powered transport vehicle having a container carrying bed, support means for forming a first horizontal pivot axis bearing for the container above and toward the rear of said vehicle body, and connecting means rotatable about a second horizontal axis fixed with respect to the vehicle bed and spaced from said first axis for pivotally engaging the container at a third horizontal pivot axis fixed with respect to the container and spaced from said axes; first power means for expanding said connecting means to increase the spacing between said second and third axes to correspondingly pivot the container rearwardly and upwardly about said first axis for discharge of the container contents; second power means for rotating said connecting means about said second axis from a first position wherein the container is on the vehicle bed to a second position wherein the container is entirely removed from the vehi-

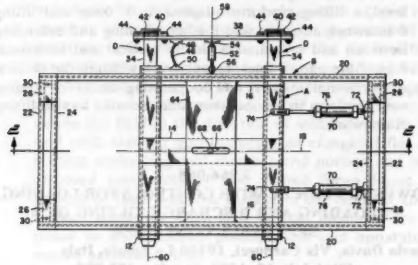
cle bed and placed upon the vehicle support surface; said support means including a support mounted on each side of said vehicle bed to be selectively moved from an upright position defining the position of said first pivot to a second position for purposes of storage; each of said support means further being mounted for movement between selected positions corresponding to different first axis location; a container having a plurality of first axis rigid pins on each side spaced from each other corresponding to said first axis location; and each of said supports being a rigid arm pivotally mounted about a fourth axis to said vehicle body and fixing the distance between said first axis and said fourth axis; and said first axis pins on each side being located on an arc having said fourth axis as a center of curvature.

3,966,069

SPREADER FOR LIFTING CONTAINERS

Jack E. Fathauer, Roxboro, N.C., assignor to RPC Corporation, Roxboro, N.C.

Filed Nov. 29, 1974, Ser. No. 528,168
Int. Cl.² B66F 9/14
U.S. Cl. 214—620 **13 Claims**



11. In a generally rectangular container lifting spreader frame mountable upon tines of a fork truck or the like and including power means for shifting said frame relative to the tines rotatably about a generally vertical axis and generally horizontally in directions both parallel and perpendicular to the longitudinal axes of the tines, said spreader frame including base and upper frames, the improvement comprising; at least one elongated slot in one of said frames extending generally parallel to one of said horizontal directions, and a fixed pin extending from the other of said frames and being received in said slot.

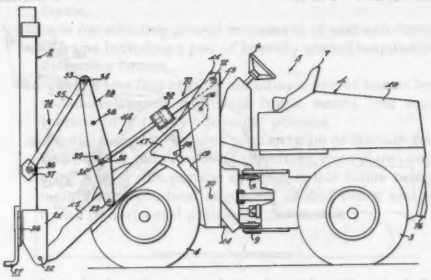
3,966,070

MECHANISM FOR LOADER BUCKET OR FORKLIFT MAST ON A MATERIAL HANDLING VEHICLE

John W. Barth, Topeka, Kans., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 7, 1974, Ser. No. 512,736
Int. Cl.² E02F 3/70
U.S. Cl. 214—776 **10 Claims**

1. A load carrying mechanism for a material handling tractor comprising, support means including upright supports on a chassis, boom means pivotally supported on said upright supports, at least one lift cylinder pivotally mounted on said support means and pivotally connected to said boom means to pivotally lift said boom means, at least one crossarm pivotally supported on said boom means, a leveling cylinder pivotally connected between said support means and said crossarm, a leveling link pivotally connected to said crossarm, a load carrying attachment pivotally connected to said leveling link and pivotally mounted on said boom means, said attachment selectively and alternatively including a mast supporting a forklift carriage and a material handling bucket, said crossarm defining a first pair of holes with a first hole receiving a pin connected to said leveling cylinder and a second pin received in a second hole connected to said leveling link whereby said boom means and said leveling link operate said material handling bucket, said crossarm defining a second pair of holes with a third hole receiving a pin connected to said leveling



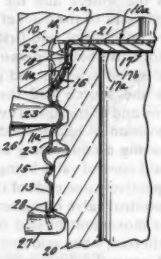
cylinder and a fourth hole receiving a pin connected to said leveling link whereby said boom means and said leveling link operate said mast supporting said forklift carriage, and wherein said leveling cylinder and link, when connected to said second pair of holes, have a substantially different operating geometry than when connected to said first pair of holes.

3,966,071

VENTING BOTTLE CLOSURE

John D. Northup, 2460 Underhill Road, Toledo, Ohio 43615

Filed May 1, 1975, Ser. No. 573,745
Int. Cl.² B65D 51/16
U.S. Cl. 215—260 **5 Claims**



1. A pressure relieving bottle closure, comprising:

a top panel positioned above the top finish of a bottle;

a cylindrical side skirt connected to the top panel and positioned circumjacent a side finish below and adjacent the top finish of the bottle;

a resilient sealing liner interposed between the top panel of the closure and the top finish of the bottle and between the side skirt of the closure and the side finish of the bottle; and

means for retaining the closure to the bottle with the sealing liner compressively engaged between said top panel and the top finish of the bottle and between said side skirt and a portion, but less than all of the side finish of the bottle;

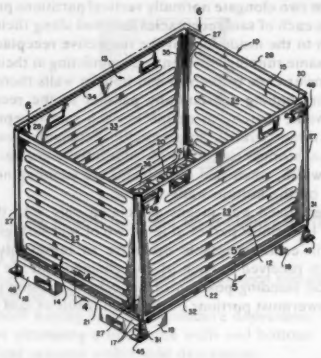
said side skirt including at least one relieved area adjacent the uncompressed portion of the liner whereby, under sufficient internal bottle pressure, the portion of the sealing liner which is not compressed between said skirt and the side finish of the bottle is free to bulge outwardly at the location of the relieved area to pass pressurized fluid to relieve excess pressure in the bottle.

3,966,072

COLLAPSIBLE CONTAINER

Joseph M. Gonzales, and Armond J. Page, both of Boonsboro, Md., assignors to Fairchild Industries Inc., Germantown, Md.

Filed June 13, 1974, Ser. No. 478,893
Int. Cl.² B65D 7/30
U.S. Cl. 220—7 1 Claim



1. A collapsible container comprising a base, two substantially opposing wall portions rotatably connected to said base, said rotatably connected wall portions each being rotatable inwardly to occupy a position above the upper surface of said base when said container is in the collapsed configuration, and two substantially opposing slidable wall portions, said slidable wall portions being removable from said container wherein the improvement comprises means for preventing said slidable wall portions from being dislodged from said container when said container is in the erected configuration, said dislodgment preventing means comprising latch means located on the upper portion of at least some of said wall portions, said latch means comprising a handle for moving the latch means to its open or closed position, a spring for exerting a force on said handle, a latch member associated with said spring, a pivot pin about which said handle pivots and a connecting link member which interconnects said latch member and said handle, the attachment position of said connecting link member to said handle being located below the level of said pivot pin when said latch means is in the open position, said latch means being totally located within the outer confines of the erected container.

3,966,073

ELECTRIC CORD HATCH

Dennis M. Geisel, South Bend, Ind., assignor to Mid America Sales Co., Inc, Elkhart, Ind.

Filed July 19, 1971, Ser. No. 163,897
Int. Cl.² H02G 3/22; H05K 5/03
U.S. Cl. 220—3.8 4 Claims

1. A hatch for an electrical cord for mobile homes, campers, trailers and similar vehicles, comprising a hollow body, a plate-like front member attached to said body and having an opening therein communicating with the hollow interior of said body, a cover for said opening pivoted near the top to said front member, a means defining a notch-shaped opening in the lower portion of said cover for the cord while said cover is in closed position, a cover for said second mentioned opening extending beyond the periphery thereof and overlying a surface of said first mentioned cover when in closed position, said second mentioned cover being pivoted to said first mentioned cover and moving angularly from a position closing said second mentioned opening to a position at which said second mentioned opening is fully open, a latch means yieldably securing said covers in their closed positions, said latch means including a lug mounted on said hollow body and projecting through said notch-shaped opening and said second mentioned cover including a tongue extending under said lug

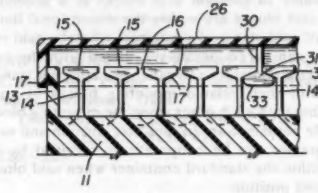
releasably latching said second mentioned cover in its closed position, means for supporting said second mentioned cover for movement between closed and opened positions, and a cord opening in said body to the rear of said front member through which the cord can be extended and retracted.

3,966,074

TERMINAL BOX AND COVER

Kenneth W. Hotchkiss, Golden, and George A. Kopp, Sr., Boulder, both of Colo., assignors to Proto Production Plastics, Inc., Boulder, Colo.

Filed Apr. 28, 1975, Ser. No. 572,116
Int. Cl.² H01R 13/44; B65D 43/10
U.S. Cl. 220—3.8 2 Claims



1. A terminal box and cover comprising

a. a box having a bottom, opposite side walls and opposite end walls, said side walls comprising a plurality of side members spaced apart longitudinally of the box, each side member being provided with a top which has under surfaces overhanging part of the space between it and an adjacent side member, and

b. a cover having a top, opposite side walls and opposite end walls, said cover side walls having a plurality of latch devices on their inner surfaces, said latch devices entering the spaces between the box side wall members and engaging the under surfaces of the said box side wall members when the cover is in place on the box, and said latch devices each comprising a shank extending downwardly from the cover top and terminating in an enlarged end that engages the under surfaces of the tops of adjacent box side wall members.

3,966,075

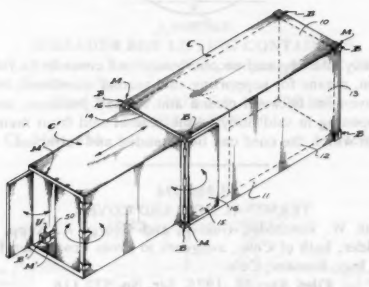
CARGO CONTAINER

Gerhard L. Schultz, 7271 Natal Drive, Westminster, Calif. 92683

Filed Jan. 10, 1975, Ser. No. 540,171
Int. Cl.² B65D 87/02, 21/02
U.S. Cl. 220—1.5 8 Claims

1. A substantially rectangular receivable cargo container in combination with and selectively cooperatively engageable with the interior and exterior of a substantially rectangular

standard cargo container having standard exterior dimensions, a cargo-receiving interior, an access opening at one side thereof and having substantially cubical standard mounting blocks at its exterior corners in fixed predetermined standard spacial relationship with each other and each having three outwardly disposed apertured exterior sides arranged in substantially parallel planes with and spaced outward from related sides of the standard container, said receivable container being smaller in exterior dimension than the interior of said standard container and includes mounting means comprising substantially standard cubical mounting blocks related to the exterior corners of the receivable container and carrier means between said blocks and said container to secure said blocks



relative to the receivable container in a first position wherein said blocks are in standard spacial relationship with each other and operable to position said blocks in a second position wherein said blocks are within the dimensional limits of the interior of said standard container, whereby said receivable container can be cooperatively related with the exterior of said standard container and other like adjacent standard containers with their related mounting blocks in cooperative relationship with each other when the mounting blocks of the receivable container are in said first position and said receivable container can be cooperatively received by and positioned within the standard container when said blocks are in said second position.

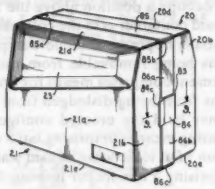
3,966,076

CONTACT LENS ACCESSORY CASE

Douglas J. Kroger; Donald J. Kroger, both of Lincoln, Nebr.; Winton D. Jensen, Leawood, and Donald L. Rohrs, Overland Park, both of Kans., assignors to Consolcase, Inc., Lincoln, Nebr.

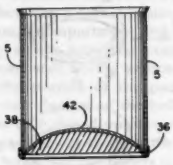
Filed May 18, 1973, Ser. No. 361,832
Int. Cl.[2] B65D 1/24
U.S. Cl. 220—20 **3 Claims**

1. A multi-compartment case for carrying, removably retaining and displaying a plurality of containers therein in vertical orientation comprising, in combination:
1. a first substantially rectangular receptacle having a side wall, substantially parallel end walls and substantially parallel top and bottom walls,
2. a second substantially rectangular receptacle having a side wall, substantially parallel end walls and substantially parallel top and bottom walls,
3. said receptacles having a width at least equal to the height thereof, as well as being congruent in form and equal in open face area,
4. base support means on said receptacle bottom walls operative to mount said case as a standing, self-supporting unit in both closed and open positions, normally erect on the bottom walls of the receptacles,
5. normally vertical hinge means joining in flexible fashion the free edges of one end wall of each of said receptacles, whereby same may be moved together and apart in a normally horizontal plane around said hinge to form closed a standing, self-supporting, integral closed container and when open a pair of standing, self-supporting, angled apart, open-face receptacles, respectively,
6. normally vertical latch means cooperatively mounted on each of the other end walls of said receptacle operative to engage one another and form said standing integral closed container when said receptacles are pivoted to closed position around said hinge,
7. at least two elongate normally vertical partitions provided within each of said receptacles fastened along their entire length to the inside face of the respective receptacle side wall, same running between and connecting at their upper and lower ends to the top and bottom walls thereof and further running substantially parallel to the receptacle end walls, thereby to define in each said receptacle at least three parallel, substantially rectangular, normally vertical storage chambers of substantially greater height than width, when said receptacles are standing normally erect on the bottom walls thereof,
8. limited, fixed wall means associated only with the normally lowermost part of at least two of said storage chambers in each receptacle operative to removably retain objects received in each of said chambers in the normal vertical standing position of the case by closing off only the lowermost portions of the open fronts of said storage



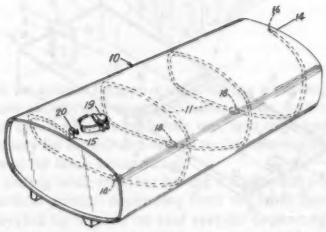
chambers, while permitting ready insertion and removal of such objects without moving said wall,
9. each said latter wall means made up of an assembly comprising at least a front wall member, a top wall member and a back wall member, the said front wall member hingedly connected to the bottom wall of one receptacle and the top wall member thereof being open centrally, whereby said assembly, before use of the case, is pivoted around said hinge into position in the lower end of its corresponding compartment with the front and back wall members normally vertical, the top wall member normally horizontal and the assembly retained in this position in its compartment by lugs on a wall of the compartment overlying one wall of the assembly,
10. the entire, normally uppermost portions of the side walls of each of said receptacles tapering upwardly toward one another when said case is closed, and
11. a normally horizontal elongate grasping indentation or recess provided in each of the upper tapered portions of the side wall of each said receptacle adjacent the upper edge thereof,
12. each said recess running substantially the length of the said side wall,
13. said recesses serving, in combination, when the case is closed, as a normally horizontal grasping and carrying handle for the case, so that said case is normally carried with the storage chambers thereof in vertical orientation.

3,966,077
PRODUCTION OIL CAN AND TOOL
George W. Jardine, 12 Lake Road, Waltham, Mass. 02154
Filed May 5, 1975, Ser. No. 574,678
Int. Cl.² B65D 7/42
U.S. Cl. 220—70 1 Claim



1. An open ended, weighted tin container for fluids comprising:
a side wall;
a flanged rib flare positioned at said open end of said container on said side wall;
a bottom having an inward concave depression;
a flare extending around side walls and bottom;
a weight secured within said depression;
said weight being incorporated and secured therein by pouring molten lead into said depression and allowing said lead to harden;
said lead adhering to said tin surface due to physical and chemical binding interaction of molten led and tin;
thereby forming a curved bottom surface due to surface tension effect.

3,966,078
TANK VENT
Leland L. Johnson, Edina, and Lindley A. Parkinson, Anoka, both of Minn., assignors to Brown-Minneapolis Tank & Fabricating Co., Minneapolis, Minn.
Filed Oct. 9, 1973, Ser. No. 404,282
Int. Cl.² B65D 25/00, 51/16
U.S. Cl. 220—85 R 38 Claims

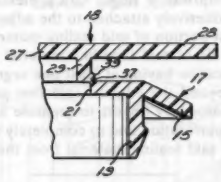


1. A vent for an enclosed chamber such as a tank, having wall structure defining said chamber, said vent comprising an elongated duct, said duct having a first end portion which communicates with the interior of such chamber, said duct having a second end portion in communication with the atmosphere surrounding said chamber, a portion of said duct within said chamber being generally horizontal and a portion of said duct being generally vertical regardless of what position the chamber assumes, and a normally closed two-way valve operatively connected to said first end portion.

3,966,079
SEAL FOR CAN OR LIKE CONTAINER
Kiyoshi Kawamata, Ohmiya, Japan, assignor to Nihon Seikan Kabushiki Kaisha, Japan
Division of Ser. No. 428,735, Dec. 27, 1973. This application June 6, 1975, Ser. No. 584,602
Int. Cl.² B65D 41/32
U.S. Cl. 220—266 2 Claims

1. A sealing device for covering an opening in a container, comprising:
adhesive-backed sealing material for covering said opening and adhering to said container, said sealing material having a first portion and a second portion separated by a straight perforated line, said first portion being removable along said perforation to completely uncover said opening, and said second portion remaining on said container after said first portion is removed; and
finger catch means attached underneath said first portion near the perforation for separating the two portions of said sealing material along the perforation and for removing said first portion from the container.

3,966,080
END CLOSURE WITH RESEALABLE TAB
Patricia A. Bittel, Bay Village, Ohio, assignor to Weatherchem Corporation, Twinsburg, Ohio
Filed May 15, 1975, Ser. No. 577,737
Int. Cl.² B65D 41/32
U.S. Cl. 220—269 8 Claims



1. A one-piece plastic end closure comprising a stationary base and a movable tab, said stationary base including a laterally extending opening defined in part by a peripheral edge, said tab being laterally substantially coextensive with said opening, said tab being movable relative to said stationary base between an initially closed position and an open position and reclosed position, said tab including a generally flat top portion and a skirt portion depending axially from said top portion, said skirt portion of said tab being disposed exteriorly of said peripheral edge and being connected to said stationary base at the location of said peripheral edge by a reduced thickness tearing web when said tab is in said initially closed position, said tearing web being constructed and arranged to break to permit movement of said tab from said initially closed position to said open position, said tab being disposed away from said opening when said tab is in said open position, said skirt portion of said tab being received within said peripheral edge of said stationary base when said tab is in said reclosed

position, said skirt portion including a lowermost outside corner and said peripheral edge including an uppermost outside corner, and said reduced thickness tearing web being located at said lowermost corner of said skirt portion and at said uppermost corner of said peripheral edge.

3,966,081

SEAL FOR CAN OR LIKE CONTAINER

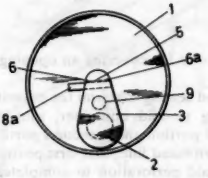
Kiyoshi Kawamata, Ohmiya, Japan, assignor to Nihon Seikan Kabushiki Kaisha, Ohmiya, Japan

Filed Dec. 27, 1973, Ser. No. 428,735

Claims priority, application Japan, July 13, 1973, 48-83544; Aug. 22, 1973, 48-98500

Int. Cl.² B65D *17/20*

U.S. Cl. 220—270 **4 Claims**



1. A sealing device for covering an opening in a container, comprising:

adhesive-backed sealing material for covering said opening and adhering to said container, said sealing material having a first portion and a second portion separated by a straight perforated line, said first portion being removable along said perforation to completely uncover said opening, and said second portion remaining on said container after said first portion is removed; and

finger catch means attached underneath said first portion near the perforation for separating the two portions of said sealing material along the perforation and for removing said first portion from the container, said finger-catch means comprises a finger catch element of tape-like material adhesively attached to the adhesive backed side of said first portion of said sealing material positioned so that one side of said tape-like material is located along said perforation having at least one segment thereof extending beyond the edge of said first portion so that it may be grasped by fingers to separate said two portions along the perforation and to completely remove said first portion of said sealing material from the container.

3,966,082

ANNULAR COLLAR SAFETY CLOSURE

Brian D. Hopkins, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

Filed Feb. 24, 1975, Ser. No. 552,073

Int. Cl.² B65D *55/02*

U.S. Cl. 220—306 **1 Claim**

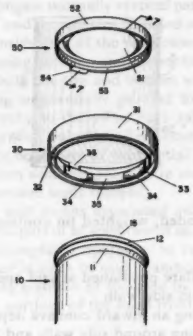
1. A rotatable safety closure annular collar in combination with a snap-fit cap and a cylindrical container

having an inwardly directed annular groove extending completely around the wall of said container and an outwardly projecting annular bead formed for releasable holding engagement with said snap-fit cap,

said projecting annular bead encircles the mouth or is positioned between the mouth and said annular groove of said container,

said snap-fit cap having a top panel, an annular skirt depending from the periphery of said top panel, a lift tab extending outwardly from the lower margin of said depending skirt, and an annular bead projecting inwardly from said depending annular skirt adapted to snap over said outwardly projecting annular bead of said container,

said annular collar comprising an upstanding exterior wall member having an access gate, an inwardly extending flange connecting said exterior wall member and an interior annular rib member having a container engaging inner wall frictionally fitted to said annular groove of said container, wherein



said container engaging inner wall has a plurality of flattened portions whereby friction is reduced and said annular collar can be easily rotated relative to said container, and

said flange has a raised flat area extending outwardly from said inner wall adjacent to and circumferentially extending at least the width of said gate whereby said flange is reinforced and access to the bottom peripheral edge of said depending annular skirt is prevented.

3,966,083

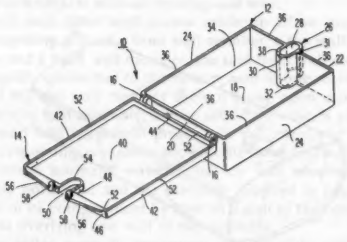
CONTAINERS FOR THE BULK PACKAGING OF ARTICLES

Louis S. Hoffman, Morristown, and Michael Lutz, Watchung, both of N.J., assignors to Dillon-Beck Manufacturing Company, Hillside, N.J.

Filed Feb. 5, 1975, Ser. No. 547,103

Int. Cl.² B65D *43/10*

U.S. Cl. 220—306 **8 Claims**



1. A non-collapsible container adapted for use in the bulk packaging of articles, such as nails, bolts, screws, nuts and the like, said container being adapted to be stored or displayed in either a flat condition or hung on a supporting rod or stem, said container comprising:

a. a main body including a bottom wall and peripheral side, front and rear walls extending upwardly from the bottom wall to define a three-dimensional compartment providing the greatest article-retaining volume of the container, a hollow tubular section having a passageway therethrough, said tubular section being associated only with

the main body of the container and being joined to the front wall thereof, said tubular section being disposed with its passageway substantially normal to the bottom wall and having an inner segment defining a part of the configuration of the three-dimensional compartment and an outer segment disposed exteriorly of said compartment, said peripheral walls and inner segment of the tubular section having upper margins defining the upper boundaries of said three-dimensional compartment;

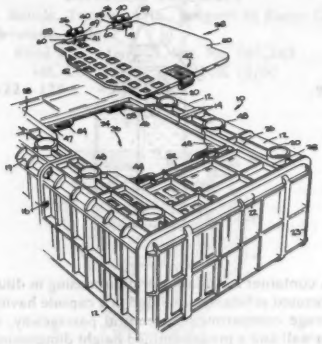
b. a lid pivotally connected to the rear wall of the main body and movable between a closed position for enclosing the three-dimensional compartment and an opened position for permitting access into said compartment, said lid including a front wall having a recess therein which is aligned with the portion of the passageway extending through the inner segment of the hollow tubular section when the lid is in a closed position so as to provide an unobstructed passageway through the tubular section for permitting a plurality of containers to be hung on a supporting rod by inserting said rod through only the passageway of the tubular section of each container, said lid including marginal surfaces for engaging the upper margins of the peripheral walls and inner segment of the tubular section of the main body when the lid is in a closed position for completely enclosing the three-dimensional compartment.

3,966,084

LATCH FOR A POULTRY TRANSPORT CAGE

Theodor Box, 1108 Aileen Road, Brielle, N.J. 08730

Filed Aug. 21, 1975, Ser. No. 606,460
Int. Cl.² B65D *45/16, 43/16*
U.S. Cl. 220—326 **11 Claims**



1. In an animal transport cage having a rectangular frame structure supporting openwork sides, ends, bottom and top, with an enlarged opening in the top, said cage having a complementary lid hinged at one end to the opening in the top, an improved lid latch comprising:

a. a sliding latch member having a horizontal portion and a vertical portion depending from the front thereof, with a beveled lip formed on said vertical depending portion to provide a catch and guide means on said horizontal portion;

b. a transverse beam defining one side of the enlarged opening in the top of the cage at the edge of the opening opposite that which is hinged for engaging said catch; and

c. means in said lid at the end opposite said hinged end for accepting and retaining said sliding latch and including:

1. means cooperating with said guide means to permit motion of said sliding latch member in the plane of the lid perpendicular to the hinging axis and to restrain motion of said sliding latch member in all other directions; and

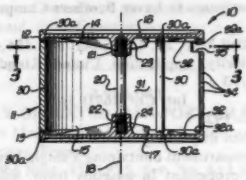
2. a bowed beam member biasing said latch outward to cause said beveled lip to engage said transverse beam.

3,966,085

LOCKING TOP AND BOTTOM CONTAINER

Dale H. Norton, Gardena, Calif., assignor to Roy Besser, Los Angeles, Calif.

Filed Nov. 10, 1975, Ser. No. 630,307
Int. Cl.² B65D *45/00*
U.S. Cl. 220—327 **8 Claims**



1. In a locking top and bottom container,

a. an upright cylindrical body having open upper and lower ends surrounded by rims,

b. upper and lower discs closing and extending across said body upper and lower ends, respectively,

c. retainer means extending axially within said body and having upper and lower connections to said upper and lower discs respectively,

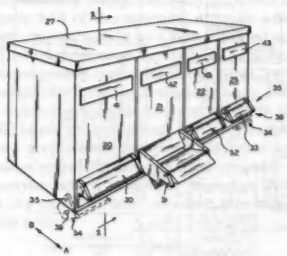
d. at least one of the connections to one disc being a threaded connection allowing rotation of the one disc in a tightening direction about said axis to peripherally tighten against one end rim of the body, and disc rotation in a loosening direction about said axis to loosen the one disc from the body allowing access to the body interior.

3,966,086

DISPENSER

Gordon W. Kelso, P.O. Box 3672, Austin, Tex. 78764

Filed May 27, 1975, Ser. No. 580,734
Int. Cl.² B65H *5/00*
U.S. Cl. 221—234 **10 Claims**



1. A dispenser comprising at least one bin with a bottom opening and having a sloping floor for guiding and directing objects contained in the bin toward the bin opening, a sliding drawer individually associated with the bin and having a compartment beneath the bin opening for receiving pills stored in the bin, shapable means in the form of a pad superimposed over said bin opening, which pad may be shaped to at least partly cover said bin opening and to provide a hole with a reduced size as compared to the size of said bin opening for selectively enabling passage of approximately a predetermined number of said pills through said bin opening and into said compartment, whereby said hole reshapes said opening

and does not necessarily have to have any predetermined minimum shape, size, or dimensions established by the shape, size or dimensions of said bin opening and movable trapdoor means associated with the compartment, said trapdoor being openable for enabling pills in the compartment to fall from said dispenser.

3,966,087

AEROSOL DISPENSING DEVICE CONTAINING A HAIRSETTING PREPARATION HAVING A LOW PROPELLANT CONTENT

Kenneth Vasey Curry, Heatherside; Rustom Kooverji Gamadia, London, and Barry Graham Pike, Yateley, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,404

Claims priority, application United Kingdom, Mar. 30, 1973, 15323/73

Int. Cl.² B67D *5/06*

U.S. Cl. 222—192 **2 Claims**

1. An aerosol dispensing device having

i. a first compartment containing a single liquid phase product and propellant in gaseous form, said single liquid phase comprising by weight from about 50 to about 99% water, from 0 to about 40% of a water-miscible organic solvent, from about 0.2 to about 5% of a film-forming resin and from about 0.001 to about 25% of a propellant dissolved therein;

ii. a dispensing valve arranged to interconnect the first compartment and the atmosphere;

iii. a second compartment containing propellant gas; and

iv. a communicating valve arranged to interconnect the second compartment and the first compartment, thereby to allow the propellant gas to pass from the second compartment to the first compartment.

3,966,088

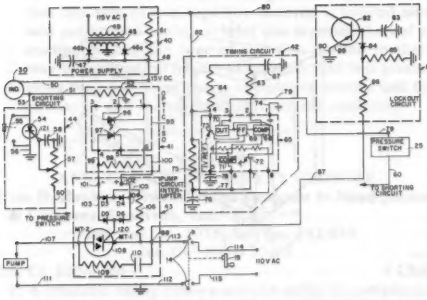
LEAK DETECTION APPARATUS

David E. Reynolds, Littleton, Colo., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 459,151, April 8, 1974, Pat. No. 3,935,567. This application Apr. 14, 1975, Ser. No. 567,669

Int. Cl.² G01M *3/00*; **B67D** *5/08*

U.S. Cl. 222—63 **8 Claims**



1. A leak detection apparatus for a dispensing apparatus having a pump and a pressure-sensing apparatus with an output switch means responsive to a predetermined pressure comprising:

a. a pump interrupter circuit means having a control input wherein said pump interrupter control circuit comprises an optical isolation circuit having a LED diode signal input and a photo-SCR controlled output; a shorting circuit means connected across said LED diode signal input, said shorting circuit means having a control input connected to said output switch means; and means for connecting said photo-SCR controlled output across said pump interrupter circuit means control input.

b. a pump interrupter control circuit means having an input and an output connected to the control input of said pump interrupter circuit means wherein said pump interrupter control circuit comprises an optical isolation circuit having a LED diode signal input and a photo-SCR controlled output; a shorting circuit means connected across said LED diode signal input, said shorting circuit means having a control input connected to said output switch means; and means for connecting said photo-SCR controlled output across said pump interrupter circuit means control input;

c. a timing circuit means having an output and input means for initiating a signal at said output for a predetermined period of time; and

d. means for connecting said timing circuit means through said pressure-sensing apparatus output to the input of said pump interrupter control circuit means,

whereby a leak in said dispensing apparatus will cause closure of said output switch means, transferring said signal at the output of said timing circuit means during said predetermined period of time to the input of said pump interrupter control circuit means, thereby causing said pump interrupter circuit means to interrupt the operation of said pump.

3,966,089

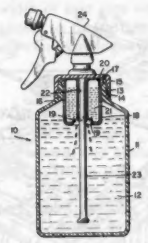
DILUTING AND DISPENSING CONTAINER

Richard James Klingaman, Darien, Conn., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,886

Int. Cl.² B67B *7/24*

U.S. Cl. 222—88 **6 Claims**



1. A container for diluting and dispensing in diluted form a concentrated substance provided in a capsule having an annular storage compartment, a central passageway, a frangible bottom wall and a predetermined height dimension in a direction parallel to the axis of said central passageway, said container comprising, in combination,

a. a hollow vessel having a neck portion terminating in a annular rim,

b. a closure cap having an inner threaded surface,

c. said neck portion having an outer threaded surface adapted to mate with said inner threaded surface of said neck portion,

d. a cradle disposed in said neck portion below said annular rim, for supporting said capsule,

e. said cradle including puncturing means projecting from said cradle toward said annular rim and terminating below said annular rim,

f. the distance from the terminus of said puncturing means to said annular rim being less than said predetermined height dimension of said capsule,

g. dispensing means disposed in said closure cap for expelling the contents of said vessel through said central passageway,

h. said puncturing means being adapted to pierce the frangible bottom wall of said capsule in response to downward

movement of said closure cap on said neck portion of the vessel, thereby releasing said concentrated substance into said hollow vessel, said capsule including a first engagement means and said closure cap including a second engagement means coacting with said first engagement means during mounting of the closure cap on said vessel to rotate said capsule in response to rotation of said cap.

3,966,090

PACKAGE FOR DISPENSING AN ANTISEPTIC COMPOSITION

Samuel B. Prussin, and Davis S. Lozano, both of Los Angeles, Calif., assignors to Dart Industries Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 799,978, Feb. 17, 1969, abandoned. This application June 19, 1972, Ser. No. 263,807

Int. Cl.² A61K *33/18;* **B65D** *35/22*

U.S. Cl. 222—94 **5 Claims**

1. A package adapted for the dispensing of an antiseptic iodine-containing composition therefrom which comprises a pressure-tight container with means to maintain two ingredients therein isolated from each other, the first of said ingredients comprising about 2 – 50 weight percent of an alkali metal iodide selected from the group consisting of potassium iodide and sodium iodide and the second of said ingredients comprising about 2 – 30 weight percent hydrogen peroxide, a liquified gaseous propellant in at least one of said ingredients and valve means communicating with each of said ingredients adapted to mix effective portions of each of said ingredients to dispense from said package a heated composition containing free iodine.

3,966,091

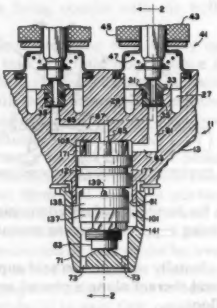
CARBONATED BEVERAGE DISPENSER HAVING DIFFUSER ASSEMBLY

Robert S. Bencic, Tucson, Ariz., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 11, 1975, Ser. No. 567,163

Int. Cl.² B67D *5/56;* **F16K** *19/00*

U.S. Cl. 222—129.1 **9 Claims**



1. A carbonated beverage dispenser including a valve body defining a bore, a carbonated liquid inlet and a syrup inlet, a nozzle having an outlet and defining an axis, and a diffuser generally within said nozzle, said diffuser comprising:

a. an inner member defining syrup passage means in open communication with said syrup inlet, said syrup passage means extending axially therethrough, a portion of the outer surface of said inner member and the bore of said valve body defining a first liquid passage in open communication with said carbonated liquid inlet;

b. an outer member surrounding said inner member and including first and second axially disposed portions, said inner member and said first portion of said outer member defining a plurality of second liquid passages communicating with said first liquid passage, said second portion of said outer member defining a generally cylindrical inner surface in spaced relation to said inner member;

c. an intermediate member surrounding said inner member and defining a generally cylindrical outer surface disposed in spaced relation within said inner surface of said outer member, said inner and outer surfaces cooperating to define a third liquid passage providing communication between said second liquid passages and the outlet of said nozzle, said third liquid passage having a gradually increasing cross sectional area in an axial direction toward the outlet of said nozzle; and

d. said outer member and said intermediate member being relatively axially movable to permit relative adjustment of said inner and outer surfaces to change the cross sectional area of said third liquid passage on a given transverse plane.

3,966,092

MANUALLY OPERATED MAN-PORTABLE SPRAYER

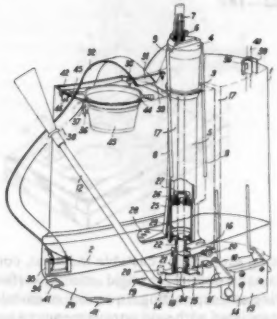
Vincent Pierre Marie Ballu, Epernay, France, assignor to Tecnoma, Epernay, France

Filed Sept. 15, 1975, Ser. No. 613,234

Claims priority, application France, Sept. 17, 1974, 74.31341

Int. Cl.² B67D *5/64;* **B05B** *9/08, 11/00*

U.S. Cl. 222—175 **5 Claims**



1. In a manually operated man-portable sprayer having a piston-type reciprocating pump the body of which extends through the upper wall of the reservoir, through which wall said body can be caused to slide by a side-mounted actuating lever, the pump being disposed centrally in relation to the reservoir, the improvement consisting in that force is transmitted from the actuating lever to the pump body through a stirrup-shaped two-branch connecting-rod which is hingedly connected to the top of the pump body and coextensive therewith and the two protected branches of which are operative within two reinforcement-forming grooves provided in that wall of the reservoir which is remote from the wall to be applied against the carrier's back, on either side of the location of the pump body.

3,966,093

VALVED WATER CONTAINER WITH SEAL

Carl E. Frahm, and Shirley E. Frahm, both of 1428 Oak Meadow Road, Arcadia, Calif. 91106

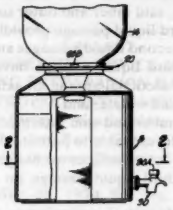
Division of Ser. No. 494,464, Aug. 5, 1974. This application Feb. 27, 1975, Ser. No. 553,685

Int. Cl.² B67D *5/06*

U.S. Cl. 222—185 **5 Claims**

1. A reservoir for water in a dispenser, said reservoir being entirely of plastic material with an apertured portion, an internally threaded bushing secured within said apertured portion and a valve structure releasably threaded in said bushing, said plastic material being relatively thin in comparison to the

length of said bushing, said apertured portion being defined by an inwardly extending and integrally formed cylindrical portion, and means between the inner wall of said cylindrical portion and said bushing securing said bushing to said inner wall.



3,966,094

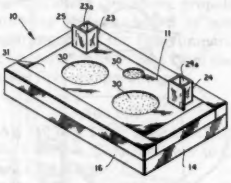
MIXING SUPPORT FOR CASTABLE MATERIAL

M. Egan Sheppard, 22 Keystone Drive, Savannah, Ga. 31406

Filed Apr. 17, 1975, Ser. No. 568,890

Int. Cl.[2] B67D *3/00*; B05C *11/00*

U.S. Cl. 222—187 **9 Claims**



1. A mixing support for castable material, comprising:

porous means defining a rigid porous surface region for receiving and supporting a quantity of castable material;

means associated with said porous means to supply a mixing liquid to said porous means at a location thereon which is remote of said rigid porous surface region to establish a flow of said mixing liquid through said porous means to emerge at said rigid porous surface region, so that a mixture of castable material received on said rigid porous surface region is exposed to the emerging mixing liquid; and

the porosity of said rigid porous surface region permitting said flow of said mixing liquid while substantially preventing said castable material from flowing into said rigid porous surface region.

3,966,095

HORIZONTALLY-OPERATED PUMP-TYPE DISPENSER

Albert R. Chappell, Jerseyville, Ill., assignor to The Metalife Company, Wentzville, Mo.

Filed Apr. 9, 1975, Ser. No. 566,175

Int. Cl.[2] B67D *5/42*

U.S. Cl. 222—384 **2 Claims**

1. A wall-bracket type dispenser utilizing a replaceable pump adapted to pump liquid from a suspended vessel, comprising

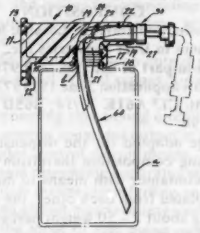
a cylindrical pump of a type adapted to operate when positioned horizontally and having at its forward end a plunger and at its aft end a dip tube, in combination with

a mounting bracket having an aft mounting portion,

a hollow, forwardly projecting portion defining a chamber whose forward end is cylindrical and substantially horizontal,

the chamber having an aft wall including an aft and downward-curving surface portion leading to a downward-presented vessel support opening spacedly forward of the mounting portion,

said aft wall including a pair of guide lobes projecting forwardly and flanking the vertical central plane of the bracket at a spacing from each other sufficient to accommodate and guide the dip tube, and



air inlet means into the chamber,

whereby the pump may be replaceably installed in the forward cylindrical chamber portion by inserting the lower end of the dip tube therethrough and camming it, between said guide lobes, downward against the aft and downward surface portion to emerge and extend downward through the vessel-support opening.

3,966,096

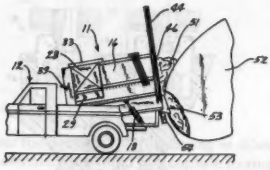
SATELLITE REFUSE PACKER

Stanley W. Worthington, Waterloo, Iowa, assignor to Wayne Engineering Corporation, Cedar Falls, Iowa

Filed Dec. 26, 1974, Ser. No. 536,415

Int. Cl.[2] B67D *5/42*; G01F *11/00*; B60P *1/16*

U.S. Cl. 222—389 **6 Claims**



1. A vehicle for handling refuse comprising:

apparatus having supporting means mounted to the vehicle body;

a container pivotally mounted to said supporting means at the front end thereof along a pivotal axis, said container having a floor;

means for pivoting the container about said pivotal axis to thereby selectively adjust the vertical height of the other end of said container for unloading refuse at the adjusted height;

door means for opening or closing said rear end of the container, said door means comprising a single door having a bottom edge, said bottom edge being adjacent to said floor in the closed position thereof;

means for slidably connecting said door means to said rear end of the container for vertical adjustment thereof;

means having an operator control member for controlling the position of said door means with respect to the container;

ram means operably disposed within said container for selectively packing materials placed within the container when the door is closed and for ejecting materials out

from said rear end of the container when said door is at least partially open; and

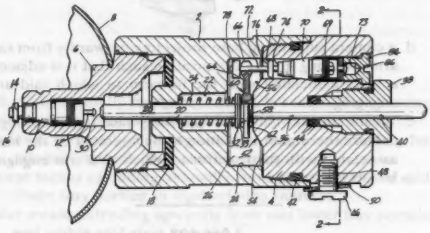
means having an operator control lever adjacent to said operator control member of said controlling means for operating the ram means, whereby the positions of said ram means and said door means can be simultaneously controlled by one person for metering refuse from said container.

3,966,097

FLUID METERING VALVE

Marlyn Dale Crown, and Carl Eugene Finley, both of Sycamore, Ill., assignors to Olin Corporation, New Haven, Conn.

Filed July 2, 1975, Ser. No. 592,707
Int. Cl.[3] G01F 11/38
U.S. Cl. 222—402.2 9 Claims



1. An apparatus for providing a measured amount of fluid under pressure from a reservoir of a bulk supply of fluid of the type having an outlet valve normally closed against fluid flow, said apparatus comprising:

a. means forming a measuring chamber for containing a predetermined volume of fluid under pressure;

b. means forming a first fluid flow passage into said measuring chamber from the fluid reservoir outlet said first fluid flow passage being coaxial with the bulk supply outlet valve;

c. a probe coaxial with the bulk supply outlet valve and mounted in said first fluid flow passage for axial movement therethrough between a first position free of engagement with the bulk supply outlet valve and a second position engaging the bulk supply outlet valve to open the latter, and return;

d. means forming a second fluid flow passage out of said measuring chamber, said second fluid flow passage being radially offset from and having a portion with an axis which is substantially parallel to the axis of said probe;

e. valve means contained in said second fluid flow passage;

f. lever means mounted on said probe between end surfaces thereof and extending radially therefrom, said lever means engaging said valve means to hold the latter open while said probe is in said first position and said lever means being movable with respect to said valve means in response to axial movement of said probe toward said second position to close said valve means before said probe reaches said second position to enable filling of said measuring chamber with a measured amount of fluid under pressure while said probe is in said second position.

3,966,098

PAINT APPLICATOR

Joseph F. Brown, Oakland, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Sept. 17, 1974, Ser. No. 506,771
Int. Cl.[2] G01F 11/22
U.S. Cl. 222—413 3 Claims

1. A dispenser and applicator of paint, comprising

a hollow tubular housing mounted to rotate within

a hollow collar rotatably mounted about the exterior of said housing so that said collar remains relatively fixed when the enclosed housing is rotated,

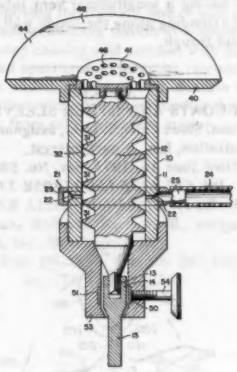
a worm gear mounted inside of said housing so as to be free to rotate with respect to said housing,

said worm gear fitted at a first end with a drive member that extends externally beyond a first axial end of the housing,

said drive member externally shaped to engage a means of rotatable power,

a circular disc, which serves as a dispenser and applicator of liquid coating, externally joined to a second axial end of said housing, said disc formed with through perforations leading to the interior of the housing,

said hollow collar fitted with attachment means to join a dispensing tube leading from a supply of liquid coating to the interior of the collar, with said housing fitted with through perforations in the wall of the housing surrounded by the collar, said perforations leading to the interior of the collar so that liquid coating in the collar interior is led into the interior of the housing, and



drive means to rotate the housing with respect to the worm gear inside the housing, when the worm gear is rotated by rotation of the drive member, such that

rotation of the worm gear within the housing, relative to the housing, forces liquid coating in the housing interior out of the perforations of the disc and onto the external surface of the disc for application by the disc to a surface to be coated, said rotation of the worm gear serving to draw said coating into the housing through the perforations in the housing wall leading to the interior of the collar and serving to consequently draw said coating into the collar interior from a dispensing tube attached to the collar leading from a supply of liquid coating, with

rotation of the housing serving to rotate the disc to rotatably apply the coating on the exterior of the disc to a surface to be coated.

3,966,099

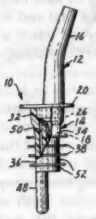
TWO MEMBER POURING DEVICE HAVING VENT

Walter E. Sanford, Jr., Hugo, Minn., and Peter R. R. Rupp, St. Croix Falls, Wis., assignors to Aladdin International, Inc., St. Paul, Minn.

Filed May 1, 1975, Ser. No. 573,775
Int. Cl.[3] B67D 3/00
U.S. Cl. 222—478 10 Claims

6. A pourer for dispensing liquid from a narrow necked bottle, said pourer comprising a rigid spout member for guiding the flow of liquid from the bottle and a flexible resilient sealing member for sealingly seating within the neck of the

bottle and removably attaching the pourer thereto, said spout member including a rigid base portion having a longitudinal bore therethrough and having a longitudinally extending trough in the outer wall thereof, said flexible sealing member



comprising a tubular body tightly fitting over said rigid base portion and having a longitudinal vent tube provided as an integral part extending along the inside wall thereof and seating within said trough.

3,966,100

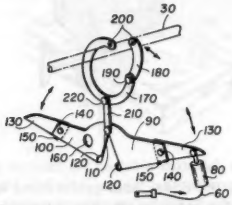
LOCK FOR COATS AND OTHER SLEEVED GARMENTS

Daryl A. Nelson, Sioux Falls, S. Dak., assignor to The Raymond Lee Organization, Inc., a part interest

Filed June 16, 1975, Ser. No. 586,975

Int. Cl.² A47J *51/10;* **E05B** *73/00*

U.S. Cl. 223—92 **4 Claims**



1. A coat lock, comprising:

a clothing hanger member which is elongated and has opposed pair of ends;

hanger means with two curved members that each have a free end, the hanger means being attached to the top of the hanger member intermediate its ends to enable the hanger means to be secured to a clothes bar when the free ends of the members are secured together and to enable the hanger means to be detached from the clothes bar when the free ends of the members are separated from each other;

a flexible cable secured at one end to an end of the hanger member; and

lock means attached to the end of the cable remote from the hanger member and detachably securing this remote end to the free ends of the curved members to form a closed loop while simultaneously securing the free ends of the members together.

3,966,101

CAMERA SUPPORT

William P. Taylor, III, 963 Renwood Drive, Kettering, Ohio 45429

Filed Dec. 5, 1974, Ser. No. 529,626

Int. Cl.² A44C *5/00;* **G03B** *17/00*

U.S. Cl. 224—28 R **11 Claims**

1. A camera support comprising:

a. substantially rigid arm engaging means including a section having an appreciably greater length than width to permit said arm engaging means to extend along and engage at more than a single point portions of the forearm of one using said support,

b. means for wrapping at more than a single point the forearm along which said arm engaging means extends,

c. said arm wrapping means being secured to said arm engaging means and thereby rendering substantially immobile said arm engaging means with respect to the forearm along which it extends,

d. a camera supporting base projecting outwardly from said arm engaging means at a position such that it is adjacent a hand associated with the forearm to which said arm engaging means is attached, and

e. means on said camera supporting base for mounting a camera thereon in a position to be operated by the hand associated with the forearm to which said arm engaging means is attached.

3,966,102

SINGLE UNIT CARRIER FOR DRINKWARE

Robert T. Clark, La Mirada, Calif., assignor to Standard Oil Company, Chicago, Ill.

Filed Aug. 8, 1974, Ser. No. 495,546

Int. Cl.² B65D *71/00*

U.S. Cl. 224—45 A **7 Claims**

1. A carrier for drinkware adapted to support tapered cups or glasses on a container having a bottom, an open top and a tapered sidewall extending therebetween comprising:

a. at least one ring shaped to suspend a tapered cup or tapered glass by contact with a substantially vertical outside surface thereof;

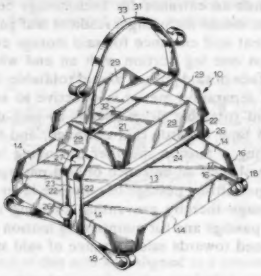
b. at least one flange attached to said ring adapted to hold said ring to the container, wherein said flange is bent to provide a horizontal arm sufficiently long to extend across a lip of the container and an arm extending downwards from the end of the horizontal arm into the inside of the container and where said container is provided with a lid having a plurality of slots whereby said at least one flange is received therein; and

c. a bar having one end attached to said ring and having a free end extending downward so as to contact the outside of the tapered container and to maintain said ring parallel to the top of the container.

3,966,103
HOLDER FOR CONTAINERS AND NAPKINS

Hyman Abrams, P.O. Box No. 27, N. Hackensack Station, River Edge, N.J. 07661

Filed Dec. 13, 1974, Ser. No. 532,620
Int. Cl.² A47G 23/06
U.S. Cl. 224—48 R 6 Claims



1. A substantially rigid structure for holding and dispensing condiment containers and napkins comprising:

a lower tray portion having a substantially planar surface for retaining a stack of napkins securely thereon;

strut means extending upwardly from opposed sides of said lower tray portion in rigid relation thereto:

slot means extending upwardly from said lower tray portion and within said strut means;

bar means extending through said slot means and slidable therein said bar means extending across said lower tray portion to rest on napkins and thereby hold said napkins in said lower tray portion, said bar means including locking means to retain said bar in said slot means;

an upper tray portion including a substantially planar surface for supporting containers and flange means for positively retaining containers on said surface;

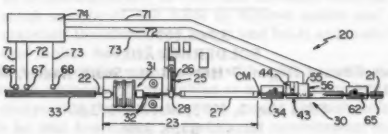
means for mounting said upper tray portion on and above said strut means above said slot means, so that said planar surfaces of said lower and upper trays remain parallel, when said structure is carried and is at rest; and

handle means extending from said upper tray portion for lifting and carrying said structure, said handle means cooperating with said flange means to support said containers.

3,966,104
APPARATUS FOR SEVERING REINFORCED ELASTOMERIC CONDUIT

Homer N. Holden, Sylva; James P. Hunt, Clyde; Vernon D. Browning, Waynesville; Edward L. Hoglen, Candler, all of N.C., and Donald L. Kleykamp, Springboro, Ohio, assignors to Dayco Corporation, Dayton, Ohio

Filed Mar. 5, 1975, Ser. No. 555,492
Int. Cl.² B65H 35/10
U.S. Cl. 225—96 12 Claims

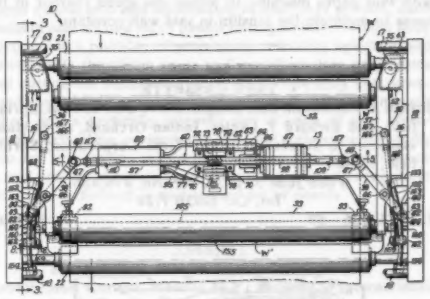


5. In a machine system for producing a continous flexible elastomeric cylindrical conduit having a particular circumference and a wall thickness and which is reinforced by a plurality of axially extending helical wires and in which said system employs a plurality of elongated rigid mandrels operatively associated in aligned end-to-end relation for supporting said conduit during continuous production thereof the improvement comprising an apparatus for severing said conduit adjacent associated ends of each pair of associated mandrels, said apparatus comprising, first moving means for moving each conduit covered mandrel at a particular speed as its exits a fabrication area of said system, weakening means for weakening said conduit around its entire circumference and through substantially its entire wall thickness at a location adjacent associated ends of each pair of associated mandrels, said weakening means being at a weakening station downstream of said fabrication area, a cutting device at a cutting station arranged between said fabrication area and said weakening station for cutting each of said plurality of helical reinforcing wires adjacent said location, said cutting device providing a longitudinal rectilinear cut through said conduit at one circumferential position therealong which extends into said conduit a sufficient distance to cut said wires yet with a portion of an associated rigid mandrel in a supporting position therewithin, and second moving means downstream of said weakening means for moving the forward one of said pair of mandrels as it exits said weakening station at a speed faster than said particular speed causing said conduit with its cut helical wires to be severed apart around its entire circumference and through its entire wall thickness at said location and causing said forward mandrel with a length of conduit therearound to be moved rapidly from said weakening station.

3,966,105
WEB ALIGNING APPARATUS

Thomas F. Curran, Hoffman Estates, Ill., assignor to Cary Metal Products, Inc., Barrington, Ill.

Filed Aug. 10, 1973, Ser. No. 387,235
Int. Cl.² B65H 25/26
U.S. Cl. 226—21 26 Claims



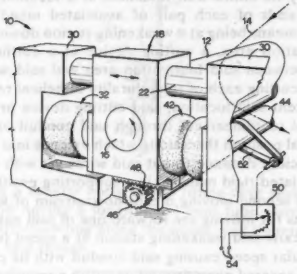
1. In an apparatus for returning a moving web to a desired path of travel after a lateral deviation therefrom, said apparatus comprising support structure including a pair of laterally spaced support members, a tilt frame disposed between said support members, said tilt frame including a pair of laterally spaced, longitudinally extending frame members, at least one steering roller rotatably mounted at its ends in said frame members, said roller being arranged so that its axis extends generally transversely to the path of travel of said web, and means connecting said tilt frame to said support members for tilting movement with respect to said web, the improvement of sliding bearing means carried by at least one of said support members and at least one of said frame members for supporting said tilt frame and guiding the movements thereof, said sliding bearing means having bearing surfaces permitting said one frame member to slide relative to said one support member in only one plane and said tilt frame to tilt only in said one plane.

3,966,106

FOLLOWER ROLL SUSPENSION SYSTEM

Adu Randpalu, Lasalle, Canada, assignor to Dominion Engineering Works, Limited, Lachine, Canada

Filed July 24, 1974, Ser. No. 491,231
Int. Cl.² B65H 25/04
U.S. Cl. 226—42 4 Claims



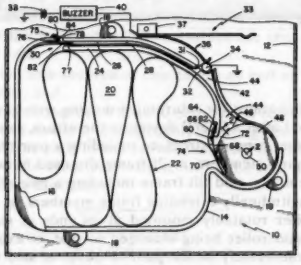
1. A spring roll system for a paper machine having a roll mounted between spaced bearing blocks for rotation therebetween when in use in web tensioning relation, roll support means comprising a pair of spaced horizontally extending shafts carrying low friction bearing means in supporting relation with said bearing blocks to permit in operation substantially linear horizontal displacement of the roll over a range of displacement in respsonse to a component of tension forces produced by a said web, closed air bag spring means to position said roll intermediately of said range of displacement, and means responsive to the relative position of said roll in said range of displacement connected in speed controlling relation with said paper machine to adjust the speed thereof in the sense to maintain the tension in said web constant.

3,966,107

TAPE CASSETTE

Joseph A. Costantini, East Longmeadow; Glen E. Flint, Springfield, and Richard J. Lanier, Indian Orchard, all of Mass., assignors to Standard Electric Time Corporation, Springfield, Mass.

Filed June 5, 1974, Ser. No. 476,426
Int. Cl.² G03B 1/24
U.S. Cl. 226—59 9 Claims



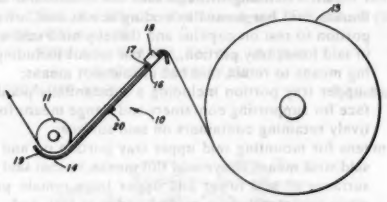
1. In a tape cassette including a storage housing means for storing an endless perforated program tape in random fashion, a storage compartment, a rotatable drum compartment, said storage housing having a sidewall portion and an inner wall member defining a passage for said tape extending from said storage compartment to an opening in said cassette to permit movement of said tape over a sensing position adjacent a sensing means of associated equipment to said rotatable drum compartment, drive means including a rotatable drum means located within said rotatable drum compartment, said drum means having at least one peripheral groove and a plurality of projections which extend outwardly from a peripheral surface of said drum means to engage said perforations in said tape for advancing said tape by pulling said tape from said storage compartment through said passage, over said tape sensing position towards an entrance for said storage compartment, and separation means including a resilient leaf guide member located adjacent said entrance for said storage compartment having at least one leg portion with an end which slidably engages a surface of said groove of said rotatable drum means, whereby said separation means is effective to separate said tape from said rotatable drum means as said drum means advances said tape towards said entrance, and tape control means including a tension member extending towards said inner wall member at an entrance of said passage to contact said tape for permitting passage of only one layer of said tape into said passage thereby preventing clogging of said tape adjacent said passage and for maintaining tension on said tape as it is advanced towards said entrance of said storage compartment.

3,966,108

INERTIA ISOLATOR

Alfred Kent Boyd, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 11, 1974, Ser. No. 450,039
Int. Cl.² B65H 17/42
U.S. Cl. 226—114 8 Claims



1. In a web transport system having a frame, web material wound on a supply reel, and at least one drive roller for unwinding the web material from the supply reel, an inertia isolator, comprising:

a. a first relatively stiff member fixedly mounted to the frame, adjacent the drive roller;

b. a flexible member, attached to the first member, opposite the drive roller; and

c. a second relatively stiff member attached to the flexible member, positioned adjacent the supply reel, and slidably engaging the web material for providing a flexing motion in a direction that tends to unwind the web material when the drive roller is accelerated and for providing a flexing motion in the opposite direction when the drive roller is decelerated.

3,966,109

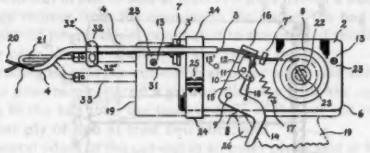
SOLDERING AID

James Edward Hogan, 7 Harvard St., South Hadley, Mass. 01075

Filed May 2, 1975, Ser. No. 573,874
Int. Cl.² B23K 3/06
U.S. Cl. 228—52 10 Claims

1. Soldering aid for handoperated feeding of measured lengths of soldering string to the heating wire tip of a soldering gun, having a trigger for control of heating intervals, which soldering aid comprises: a base plate, mounted above the trigger on one side of the soldering gun, a hand lever being

pivoted near the lower edge of the central part of the base plate and having a handling arm extending approximately to a location parallel to the trigger and a locking arm extending in the opposite direction, a storage reel carrying a supply of soldering string and being pivoted on the rear part of the base plate, a protective tube mounted partially on the forward part of the base plate and partially in a hollow heat-resisting bead seated over the heating wire of a soldering gun; a springloaded finger clamp being pivoted on the locking arm, a lug attached



to the free end of this arm and aligned as a counterhold for the finger clamp pressing against the soldering string when the hand lever is being swiveled for intermittent forward transport of soldering string which is drawn from the storage reel and pushed through the protective tube unto the heating wire tip, and further comprises a coil spring, as a means for keeping the finger clamp off any gripping contact with the soldering string when the locking arm is being swiveled in direction toward the storage reel, freeing the finger clamp for backsliding under the soldering string.

3,966,110

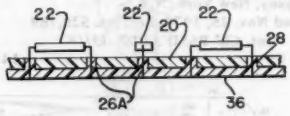
STABILIZER SYSTEM WITH ULTRASONIC SOLDERING

Kenneth G. Boynton, Milford, N.H., assignor to Hollis Engineering, Inc., Nashua, N.H.

Continuation-in-part of Ser. No. 508,052, Sept. 23, 1974. This application Mar. 11, 1975, Ser. No. 555,271

Int. Cl.² B23K *31/02, 1/08*

U.S. Cl. 228—175 **28 Claims**



1. A method of mass joining with solder printed circuit boards having mounted thereon components with leads extending through holes in lands on the board, said method comprising the steps of:

holding said components in position in said board by coupling said lands and leads to one another with a solid stabilizer material which is compatible with said solder and has a melting point below that of said solder, and

immersing said board and leads at least in part in a molten body of said solder to which vibratory energy is imparted so as simultaneously to melt said stabilizer material and scrub said lands and leads to remove oxides and said materials therefrom, and to wet said lands and leads with said molten body of solder.

18. A system for mass joining with solder electrical and electronic components assembled in a circuit board wherein the components have leads which extend through holes in lands on said board, and comprising in combination: means for applying to said board a solid stabilizer material which is compatible with said solder and has a melting point below that of said solder; and, an ultrasonic soldering station adapted to apply to said lands and leads a molten body of said solder to which vibratory energy is imparted so as to scrub said lands and leads to remove oxides and said stabilizer material therefrom, and to simultaneously wet said lands and leads with molten solder.

3,966,111

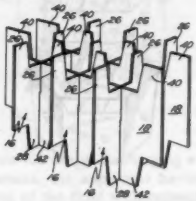
CONTAINER PARTITIONING

Brian A. Grimes, Warwick, R.I., assignor to Grimes Box Company, Inc., East Providence, R.I.

Filed Oct. 20, 1975, Ser. No. 624,175

Int. Cl.² B65D *5/48, 81/00*

U.S. Cl. 229—15 **6 Claims**



1. A partitioning for a container comprising first and second sets of spaced parallel panels adapted for respective transverse and longitudinal interconnection with each other to delineate a plurality of spaced cells within said container, each panel of said first set of panels having an intermediate body portion and a plurality of projections extending upwardly and downwardly therefrom so as to form alternating projections and cutouts on either side thereof, said upwardly and downwardly extending projections being laterally offset from each other, and a vertically oriented slot extending downwardly from each upper cutout into and terminating in said body portion, each panel of said second set of panels having an intermediate body portion and a plurality of projections extending upwardly and downwardly therefrom so as to form alternating projections and cutouts on either side thereof, said upwardly and downwardly extending projections being laterally offset from each other, and a vertically oriented slot in each of said downwardly extending projections, said slot extending upwardly into and terminating in said body portion, the slots as formed in said first set of panels being located for aligned engagement with slots as formed in said second set of panels.

3,966,112

TWO-PIECE, POLYGONAL CONTAINER

Robert Louis Gordon, Monroe, N.Y., assignor to International Paper Company, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 536,007

Int. Cl.² B65D *5/12*

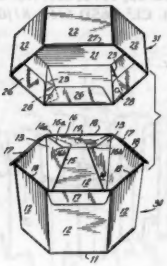
U.S. Cl. 229—23 BT **9 Claims**

1. In a two-piece, polygonal container having a paperboard base which includes: a central, polygonal, bottom panel of at least four sides; at least four, upstanding, side wall panels, foldably connected to the sides of the bottom panel; at least four, triangular gusset panels, each gusset panel being located between and foldably connected to two, adjacent, side wall panels; and at least two, downwardly extending, base-locking flaps, foldably connected to the top edges of at least two, non-adjacent, side wall panels; the central, leading edge portions of each base-locking flap being bonded to the underlying surface of a side wall panel; and each of the gusset panels being folded so that it lies substantially flat against a surface of a side wall panel and is overlain by a base-locking flap; the improvement which comprises:

the top edges of each gusset panel including an angle of 0° to 10° with the lateralmost, lateral edge portions of an overlying, base-locking flap;

the lateral edge portions of each base-locking flap overlapping the top edges of a gusset panel by no more than 5/16 inch;

a spot of adhesive being provided on a surface of each of the at least two, non-adjacent, side wall panels for bonding



the leading edge portions of the base-locking flaps to the underlying surfaces of the side wall panels; the spots of adhesive being so located that they do not contact the gusset panels; and

each base-locking flap overlying two adjacent gusset panels.

3,966,113

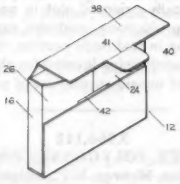
ONE PIECE BOX FOLDER

William G. Tipton, St. Louis, Mo., assignor to Cavalier Packaging Company, Inc., St. Louis, Mo.

Filed May 14, 1975, Ser. No. 570,400

Int. Cl.² B65D *5/02*

U.S. Cl. 229—40 **3 Claims**



1. A one-piece box adapted to be erected from a foldable blank, said box having a front panel provided with a slot for receiving a tuck tab of a hinged cover panel, said front panel having a thickness substantially greater than the thickness of the tuck tab in order to receive said tuck tab within the front panel, said box comprising a rear panel foldably connected to top, bottom and a pair of side panels, said front panel being comprised of a pair of underlying front side panels foldably connected to said side panels and an overlying lower front panel foldably connected to said bottom panel and adhesive means securing said last named panels together, the hinged cover panel being foldably connected to said top panel and engageable in abutting relation against the upper portion of the underlying front panels, said front side panels being provided with openings which provide a combined opening receiving said tuck tab, said combined opening having a major portion underlying the overlying lower front panel and a minor portion extending partially across the box above said lower front panel to provide said tuck tab receiving slot.

3,966,114

BOX WITH A MEMBRANE WHICH SEALS THE BOX

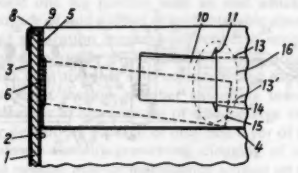
Walter Schellenberg, Diepoldsau, Switzerland, assignor to Max Sandherr AG, Diepoldsau, Switzerland

Filed June 2, 1975, Ser. No. 582,817

Claims priority, application Switzerland, July 22, 1974, 10089/74

Int. Cl.² B65D *17/20, 5/54*

U.S. Cl. 229—51 CE **10 Claims**



1. An improved pilfer-proof membrane seal for a container of the type having a replaceable lid insertable into the container opening, the seal comprising

a membrane having

a cylindrical portion extending downwardly into the open end of the container at least to the insertion depth of the lid,

said cylindrical portion lying adjacent the inner surface of the container and being at least partly sealed to said inner surface, and

a transverse portion extending across the interior of said container to close the interior volume thereof below said insertion depth; and

a tear strip extending completely around the inner surface of said container and lying between said cylindrical portion and said inner surface.

3,966,115

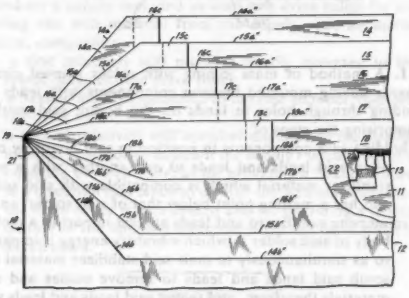
STEPPED AND ANGLE-CUT, PINCH CLOSURE

Clinton R. Hollis, Camden, Ark., assignor to International Paper Company, New York, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,789

Int. Cl.² B65D *33/02, 33/18*

U.S. Cl. 229—55 **14 Claims**



1. In an end construction for forming a pinch closure for the opening in an end of a multi-ply, tubular bag, the improvement which comrises:

at least two plies of said bag including a stepped and angle-cut flap on the portion of each ply on one side of the opening in the end of the bag and

a stepped and angle-cut cut-out in the portion of each ply on the other side of the opening in the end of the bag;

each flap on one of said at least two plies having a leading edge remote from the opening in the end of the bag and

a pair of lateral edges connected to the ends of the leading edge and the opening in the end of the bag;

the leading edge of the flap on an outer ply of said at least two plies being spaced a greater distance from the opening in the bag than the leading edge of the flap on an inner ply of said at least two plies; and

the lateral edges of the flap on an outer ply of said at least two plies including greater angles with the opening in the bag than the lateral edges of the flap on an inner ply of said at least two plies; and

each cut-out in one of said at least two plies having a leading edge remote from the opening in the end of the bag and a pair of lateral edges connected to the ends of the leading edge and the opening in the end of the bag;

the leading edge of the cut-out in an outer ply of said at least two plies being spaced a greater distance from the opening in the bag than the leading edge of the cut-out in an inner ply of said at least two plies; and

the lateral edges of the cut-out in an outer ply of said at least two plies including greater angles with the opening in the bag than the lateral edges of the cut-out in an inner ply of said at least two plies; and

the flap on each ply being adapted to fold about a fold line, located inwardly of the opening in the end of the bag, to overlap the leading edge and the lateral edges of the cut-out in its ply.

3,966,116

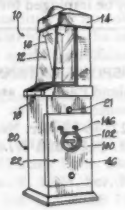
SECURITY BOX AND RECEPTACLE HOUSING FOR VALUABLES

George G. Dominick, Hoffman Estates; Ronald J. Lugowski, Rolling Meadows; Phillip D. Goodrich, Hoffman Estates, and Kenneth Erickson, Palatine, all of Ill., assignors to Qonaar Corporation, Elk Grove Village, Ill.

Filed Apr. 12, 1974, Ser. No. 460,276

Int. Cl.² G07B *15/00*

U.S. Cl. 232—7 **11 Claims**



1. In a construction for receiving valuables including a housing having a deposit section, a box for holding valuables deposited, a recess in said housing for removably receiving said box, an opening defined by said box for passage of valuables from said deposit section into said box, means normally blocking said opening, and a lock for holding said blocking means in the blocking position, said recess including means for unlocking said lock whereby said blocking means can be moved to unblocking position when the box is within said recess, the improvement wherein said blocking means comprises a door, a track receiving said door, said track serving to guide said door for sliding movement of the door on the track, a pivotally mounted arm connected to said door, means connecting said arm to said lock whereby the arm is free for movement only upon unlocking of the lock, and a handle mounted on the outside of said box and connected to said arm, rotation of the handle pivoting said arm to thereby slide said door along said track to an unblocking position.

3,966,117

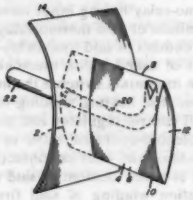
CENTRIFUGE DISCHARGE DEVICE

Walter Johannes, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 6, 1975, Ser. No. 584,557

Int. Cl.² B04B *11/02*

U.S. Cl. 233—19 A **12 Claims**



1. A discharge device for use in discharging a fluid from a fluid processing apparatus, the apparatus having means for causing relative motion of the fluid with respect to said discharge device, and the apparatus further having means for positioning said discharge device in the fluid, said discharge device comprising:

a body having a pair of converging side surfaces defining a leading surface on said body, whereby when said body is positioned in a fluid and the fluid is caused to move relatively to said body, said leading surface parts the fluid, thereby enabling the fluid to flow around and past said body in a generally streamlined flow pattern;

means defining at least one inlet port in one of said side surfaces;

an outlet tube extending from said body; and

means defining a passageway connecting said inlet port to said outlet tube, said inlet port being effective to shear a portion of the relatively moving fluid into said passageway for discharge from said outlet tube.

3,966,118

AUTOMATIC REGULATING EQUIPMENT FOR A HEATING DEVICE HAVING A VAPORIZING BURNER

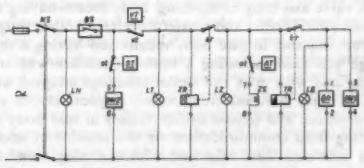
Ferdinand Karpf, 7, Josef Brennerstrasse, A-3400 Klosterneuburg, Austria

Filed June 18, 1975, Ser. No. 588,041

Claims priority, application Austria, June 19, 1974, 5074/74

Int. Cl.² G05D *23/00*

U.S. Cl. 237—2 A **12 Claims**



1. A full automatic regulating equipment for a heating device having an oil burner adapted to vaporise and burn fuel oil, an oil supply line leading to said burner, and an electrically heated ignition member for ignitioning the oil within said burner, input terminals for said ignition member, the equipment comprising a first thermostat responsive to the temperature of the burner, a contact of said first thermostat being adapted to control the delivery of electrical energy to said input terminals of said ignition member, an oil control regulator having a bi-metal element and a heating winding adapted to heat the bi-metal element, a first solenoid-operated valve

having an excitation winding, said oil control regulator and said first solenoid-operated valve being inserted in the oil supply line and adapted to control the stream of oil flowing through this line, a second thermostat responsive to the temperature of a medium to be heated by the burner and having a contact, an electronic time-delay-relay having input terminals and a contact, said input terminals of the time-delay-relay being connected in series to the contact of said second thermostat, a thermo-relay having input terminals and a contact, said imput terminals of said thermo-relay being connected in series with the contact of said time-delay-relay and in parallel with said input of said ignition member, so that said time-delay-relay with its contact switches the input terminals of said ignition member, the heating winding for said bi-metal element of said oil control regulator and the excitation winding of said first solenoid-operated valve to the supply voltage, whereas the thermo-relay with its contact switches the heating winding of the bi-metal element of said oil control regulator and the excitation winding of said first solenoid-operated valve with time delay to the supply voltage with respect to the input terminals of said ignition member.

3,966,119

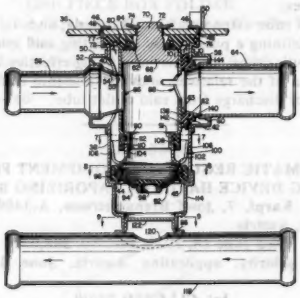
VALVE ASSEMBLY WITH PLURAL FLOW PATH CONTROL

Robert M. Harter, deceased, late of Gowanda, N.Y. (by Patricia Harter, executrix), and Gary L. Russo, Gowanda, N.Y., assignors to AVM Corporation, Jamestown, N.Y.

Continuation of Ser. No. 286,663, Sept. 6, 1972, abandoned. This application Oct. 11, 1974, Ser. No. 514,183

Int. Cl.² F16K *11/18*; **B60H** *1/02*; **G05D** *15/00*

U.S. Cl. 237—12.3 B **40 Claims**



1. A valve assembly comprising: body means having a fluid inlet and a fluid outlet and a bypass outlet; a hollow plug valve member rotatable in said body means and having a through passage provided including a hollow chamber with an end opening and with inlet and outlet openings adapted to align with said fluid inlet and fluid outlet, respectively, in a valve open position; and bypass orifice means in said body means providing fluid communication via the interior of said body means with said fluid inlet and with said plug member end opening to enable regulated discharge of fluid from said valve body through said bypass outlet.

37. A hot water system for supplying an automotive heater core comprising: a water pump; a first conduit means leading from the water pump outlet to the heater core inlet; a second conduit means leading from the heater core outlet to the water pump inlet; and a control valve assembly comprising body means having a fluid inlet and a fluid outlet connected to control flow through said first conduit means and by-pass orifice means in fluid flow communication between said first and second conduit means; a hollow plug valve member rotatably supported in the interior of said body means and defining a through axial passage communicating at one end with said by-pass orifice means and having respective side inlet and outlet openings communicating with said through passage and adapted to align with said fluid inlet and fluid outlet in an open position of said hollow plug valve member; and valve means responsive to fluid pressure within the interior of said body means for controlling fluid flow through said by-pass orifice means.

3,966,120

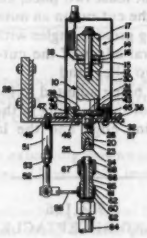
ULTRASONIC SPRAYING DEVICE

Keith A. Furgalus, Lakewood, and Harold C. Simmons, Richmond Heights, both of Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Mar. 12, 1975, Ser. No. 557,622

Int. Cl.² B05B *3/14*

U.S. Cl. 239—102 **18 Claims**



1. An atomizing device comprising a support, an acoustical horn mounted on the support, an ultrasonic generator engaging the horn to impart ultrasonic vibrations thereto when the generator is energized, said horn including a radially extending face integral therewith and opposed to a face on the support, a resilient member between said faces to separate and vibrationally isolate the horn relative to the support, means for attaching said horn to said support with said resilient means clamped between said faces, and said horn having a surface against which liquid may be impinged for atomizing the same.

3,966,121

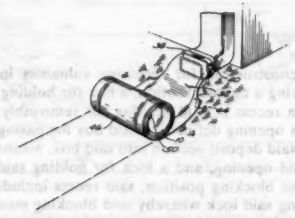
DOWNSPOUT EXTENSION

Bruce A. Littman, Highland Park, Ill., assignor to Benson Mfg. Corporation, Menomonee Falls, Wis.

Filed May 22, 1975, Ser. No. 580,100

Int. Cl.² B05B *1/14*

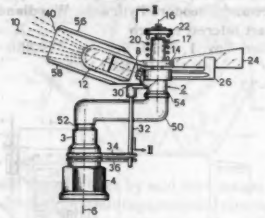
U.S. Cl. 239—197 **3 Claims**



1. A downspout extension comprising an elongated tube body, said tube being formed from two opposed tube portions, said tube portions being connected together along their edges by first longitudinal seams, second longitudinal seams spaced inwardly from said side edges to form a central water conduit, apertures in said tube portions to form water outlets, and said first seams cooperating with said second seams to form channels transverse seams closing one end of each of said channels, spring strips located in said channels to cause said tube to

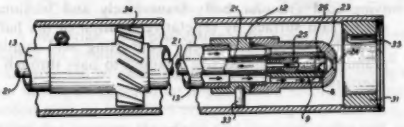
wind into a coil, said tube including a downspout connecting sleeve said sleeve being formed by said two opposed tube portions and said second longitudinal seams to form a flexible connecting sleeve free of said springs and extending from said transverse seams for attachment to the downspout, and clamping means for securing said sleeve to the downspout.

3,966,122
NON-SIDE-SPLASH WATER SPRINKLERS
Mordeki Drori, 89 Zahal St., Kiron, Israel
Filed Apr. 9, 1975, Ser. No. 566,275
Claims priority, application Israel, Aug. 30, 1974, 45573
Int. Cl.² B05B *3/08*
U.S. Cl. 239—233 **12 Claims**



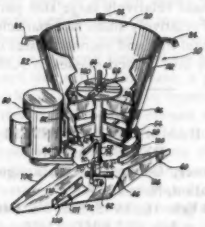
1. A water sprinkler including a sprinkler head mountable to a supply pipe for movement about a rotational axis, a nozzle carried by the sprinkler head from which the water issues in the form of a jet, and a drive member carried by the sprinkler head and impinged by the water jet for driving the head about said rotational axis, characterized in that the sprinkler includes a splash guard carried by the sprinkler head at a location to be impinged by the water splashed laterally from the drive member to substantially block side-splash therefrom, and that the sprinkler head is rotatably mounted on a rotational axis which is substantially aligned with the general vicinity of impingement of the water splashed against the splash-guard such that little or no rotary torque is applied at anytime to the sprinkler head by the impingement of the water splashed against the splash-guard during the rotation of the sprinkler head about its rotational axis by said drive member.

3,966,123
BURNER GUN
James T. Voorheis, 53 Park Lane, Essex Fells, N.J. 07021
Filed Dec. 5, 1974, Ser. No. 529,598
Int. Cl.² B05B *7/10*
U.S. Cl. 239—401 **8 Claims**



1. A burner gun comprising:
a. a oil tube,
b. a first housing attached at one end of the oil tube,
c. a second housing attached at the other end of the oil tube,
d. a piston tube in the oil tube,
e. means to move the piston tube axially in the oil tube,
f. a swirl chamber in the second housing,
g. an oil discharge opening in the end of the swirl chamber communicating with the outside of the second housing and defining an atomizer tip,
h. an axially movable piston disposed in the swirl chamber and connected to the piston tube, whereby the piston is moved in the swirl chamber,
i. at least one oil passage communicating between the oil tube and the swirl chamber,
j. the oil passage incrementally obstructable by the movement of the piston,
k. an outer tube surrounding the second housing and mounted coaxially on the oil tube,
l. a passage in the outer tube communicating with the interior of the outer tube, for introducing a gas therein,
m. means to move the outer tube axially with respect to the oil tube,
n. a nozzle on the end of the outer tuber having an elongated emission tunnel axial passage therein,
o. the nozzle arranged in spaced relation to the atomizer tip,
p. the means to move the outer tube axially with respect to the oil tube adjusts the nozzle with respect to the atomizer tip,
q. the piston having an axial bore communicating with the swirl chamber,
r. a regulator shaft connected to the piston tube in the first housing,
s. an axial bore in the regulator shaft,
t. a transverse passage in the regulator shaft,
u. an elongated chamber in the first housing in registration with the transverse passage,
v. a pressure gauge mounted on the first housing to read the pressure in the elongated chamber.

3,966,124
SPREADER FOR GRAIN AND LIKE MATERIAL
Eugene G. Sukup, Dougherty, Iowa 50433
Division of Ser. No. 452,736, March 20, 1974, Pat. No. 3,902,610. This application June 16, 1975, Ser. No. 587,056
Int. Cl.² A01C *17/00*; B65G *65/32*
U.S. Cl. 239—666 **4 Claims**



1. A spreader assembly for spreading grain or like material comprising a material receiving guide to be disposed generally vertically, a first support rotatably supported in said guide and extending therebelow, a second support extending parallel to said first support and being adjustable in a direction parallel to the axis of rotation of said first support and rotatable with said first support, a thrower member disposed beneath said guide for receiving thereon such material dropped from said guide, said thrower member being pivotally supported on said second support for axial movement therewith as said second support is adjusted axially of said first support, a link element mounted pivotally on said first support and pivotally attached to said thrower member at a location spaced from the pivotal connection of said thrower member to said second support, means for selectively adjusting the postition of said second support axially of said first support, whereby the angular position of said thrower member relative to horizontal is determined by such axial adjustment of said second support, and means for rotating said first and second supports, said link and said thrower member for distributing material received through said guide in any adjusted position of said thrower member.

3,966,125
METHOD AND FACILITY FOR THE PRODUCTION OF RUBBER FLOURS AND/OR RUBBER GRANULES FROM VEHICLE TIES

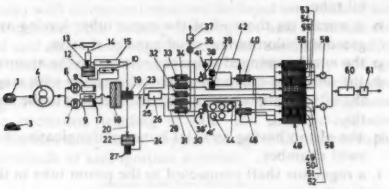
Hanspeter Finkbeiner, Kundoldingen, Switzerland, assignor to Gezolan Engineering AG, Zolfingen, Switzerland

Filed Apr. 2, 1975, Ser. No. 564,558

Claims priority, application Switzerland, Apr. 3, 1974, 4659/74

Int. Cl.² B02C *23/10*

U.S. Cl. 241—14 **4 Claims**



1. The method of recovering rubber from worn automobile tires which comprises the steps of:

initially cutting the tires to pieces by first pregrinding means;

subsequently recutting said pieces by second pregrinding means independent of said first pregrinding means;

segregating said recut pieces into metal containing and substantially metal free pieces;

comminuting said metal containing and said metal free pieces independently of each other into reduced size metal containing and into reduced size metal free pieces;

segregating said reduced size metal free pieces into a mass of relatively large size particles and into a first mass of relatively small size particles;

comminuting said relatively large size particles into a second mass of relatively small size particles; and

comminuting said first and second masses of relatively small size particles into graded masses of rubber flour.

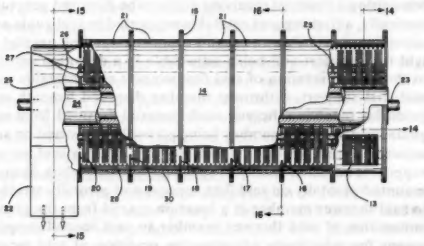
3,966,126
CLASSIFYING HAMMERMILL SYSTEM AND METHOD OF OPERATION

Edward E. Werner, Oshkosh, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Feb. 10, 1975, Ser. No. 548,593

Int. Cl.² B02C *23/30*

U.S. Cl. 241—18 **4 Claims**



1. A process for separating a body of fibrous material into substantially individual fibers which comprises passing the fibrous material in a generally helical path in a current of air while impacting with impact elements the fibrous material to break it into fibers and at the same time slowing the movement of the fibrous material relative to the impact elements by causing the material to move along and against a grid-like impervious wall surrounding the current of air so that the slowed movement of the fibrous material permits it to be subjected to repeated impacts by the impact elements, said current of air carrying defiberized fibrous material through apertured classifier rings while the said rings retain for further defiberizing action material which is insufficiently defiberized, the defiberized material passing through the apertures of the rings.

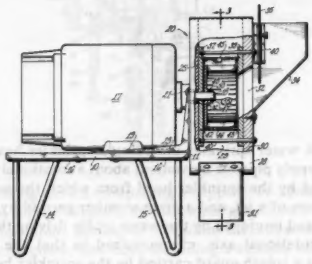
3,966,127
CENTRIFUGAL DEVICE AND PROCESS FOR CONCURRENTLY RUPTURING AND PULVERIZING GRANULAR MATERIAL, PARTICULARLY CEREAL GRAIN

Steve Pytlewski, Rodom, Poland, assignor to Raymond Pytlewski, Torrance and Theodore Pytlewski, Woodland Hills, both of, Calif., part interest to each

Filed Nov. 1, 1974, Ser. No. 519,880

Int. Cl.² B02C *13/06*

U.S. Cl. 241—73 **6 Claims**



1. That process for rupturing granular material such as cereal grain and further reducing the ruptured granules to a desired pulvurant size in a continuous procedure, said process comprising

suspending a minor volume of granular material within a gaseous flow stream and by centrifugal force effected by rapid rotation of a rotor having a cylindrical series of multiple radially-directed baffles directing said stream against a surrounding spaced surface having multiple small apertures of selected size, said stream being moved with a force adapted to rupture the grains of material by impact with said surface, but leaving at least some of them larger than capable of passing through said apertures,

accumulating and maintaining a body of thus ruptured granules extending inward from said surface beyond the outer edges of the rotor baffles, and

moving said granular body transversely and frictionally across said surface by repetative rotation of the baffles through said body, thereby converting said ruptured granules to a reduced size adapted to pass through the apertures of said surface.

3,966,128
FEED CONTROL FOR TUB TYPE HAY GRINDER

Joseph A. Anderson; Chester G. Neukom, both of Jamestown, and Ivyl Kopecky, Ypsilanti, all of N. Dak., assignors to Haybuster Manufacturing Inc., Jamestown, N. Dak.

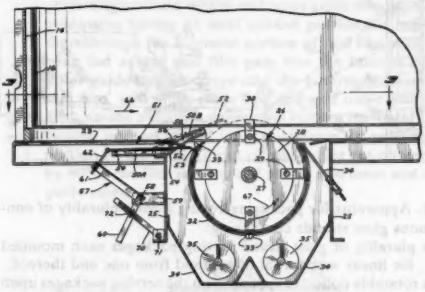
Filed Dec. 5, 1974, Ser. No. 529,918

Int. Cl.² B02C *13/286*

U.S. Cl. 241—73 **8 Claims**

1. In combination with a forage grinder having a hopper with a stationary wall, and a grinding cylinder having grinding means protruding through a provided opening in said stationary wall into said hopper, and feed means for moving forage

material to be ground along said wall and across a forage input side of said grinding means, the improvement comprising an adjustable plate member mounted in relation to said wall adjacent to said cylinder and on the forage input side of said cylinder and protruding from said wall to deflect forage material moving along said wall, and means to permit movement of said plate member between at least two positions wherein the plate member deflects forage material in said hopper being



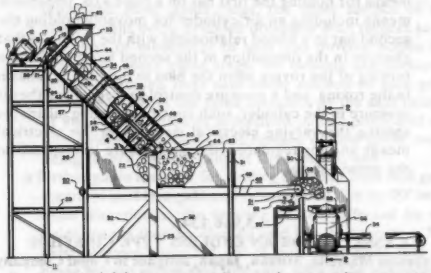
moved toward said cylinder by said feed means in a direction to limit the amount of the forage material coming into contact with said grinding means protruding into said hopper by a different amount in each position as the forage material passes over the cylinder, said plate member remaining spaced apart from the axis of said cylinder an amount greater than the maximum diameter of said grinding means when said plate member is moved between said positions.

3,966,129

REFUSE PROCESSING EQUIPMENT

John C. Brewer, Salt Lake City, Utah, assignor to Garbalizer Corporation of America, Salt Lake City, Utah

Filed May 7, 1975, Ser. No. 575,474
Int. Cl.² B02C *23/08*
U.S. Cl. 241—79.1 **17 Claims**



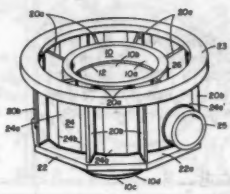
1. A materials' pre-processing and separation structure including, in combination, support structure, a declining receiver mounted to said support structure, said declining receiver having an upper input hopper and a revolving chamber provided with an input end communicating with said hopper for receiving contents therefrom and also with outlet end, said chamber being provided with interior refuse-impact arms, an elongate first conveyor having a feed end disposed underneath said outlet end and also a discharge end horizontally separated from said feed end, said first conveyor being provided with ferrous metals' separating means proximate said discharge end thereof, second and third essentially parallel, side-by-side conveyors disposed at a level beneath that of said first conveyor, said second conveyor extending forwardly of but being essentially in the same axially elongate vertical plane with said first conveyor, said second conveyor having a receiving end disposed beneath said discharge end of said first conveyor, and air-classifying blower means for directing a stream of air transversely across said second and then said third conveyor for blowing light materials descending from said discharge end of said first conveyor toward said third conveyor.

3,966,130

FRAME FOR CONE CRUSHER

Floyd F. Doty, Marion, Iowa, assignor to Iowa Manufacturing Company, Cedar Rapids, Iowa

Filed June 9, 1975, Ser. No. 585,120
Int. Cl.² B02C *2/00*
U.S. Cl. 241—285 R **5 Claims**



1. A composite frame for cone crushers and the like fabricated from a plurality of frame members and secured by welds, the members comprising: a generally cylindrical inner housing having an axis and opposite first and second axial ends, the housing having a bore therethrough along said axis; a generally annular base flange disposed in spaced surrounding relation to the outer periphery of the inner housing adjacent said first end thereof; a generally annular bowl support flange disposed in spaced surrounding relation to the outer periphery of the inner housing adjacent said second end thereof, the base and support flanges having opposed axially facing end faces and being coaxial with the inner housing; a plurality of integral rib plates disposed in planes parallel to said axis, the inner ends of the rib plates being secured as aforesaid to the outer periphery of the inner housing at spaced locations thereabout, the rib plates extending radially therefrom to and between said end faces of the base and support flanges and secured thereto as aforesaid; a plurality of filler plates secured as aforesaid between the opposed faces of each adjacent pair of the rib plates and between said end faces of the base and support flanges effective to box the rib plates and the base and support flanges and to close over the opening therebetween; and a drive shaft housing extending through both the inner housing and the filler plates between a pair of the rib plates, the drive shaft housing being secured as aforesaid to the inner housing and the filler plates and having a bore therethrough radially disposed with respect to said axis.

3,966,131

METHOD AND MACHINE FOR MAKING TWISTED WIRE BEADS FOR TIRES

John Albert LaBoda, Fairview Park, Ohio, assignor to Advance Manufacturing Corporation, Cleveland, Ohio

Continuation of Ser. No. 283,178, Aug. 23, 1972, abandoned, Continuation-in-part of Ser. No. 190,753, Oct. 20, 1971, Pat. No. 3,801,028. This application June 3, 1974, Ser. No. 475,614
Int. Cl.² B65H *81/02*
U.S. Cl. 242—4 BE **12 Claims**

1. A machine for wrapping continuous lengths of filamentary wire material helically around the surface of a circular core ring comprising:

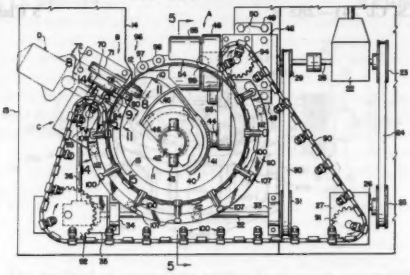
an endless roller chain having an outer span and an arcuate inner span,

an arcuate guide member adapted to be engaged by the rollers of said chain throughout said inner span,

clamping means carried by said roller chain adapted to engage and resiliently grip said core ring and filamentary material wrapped thereon in said arcuate inner span

around a major portion of the circumference of said core ring whereby said core ring is revolved with said inner span to transport successive portions of said core ring progressively across a free circumferential section in the space between the ends of said inner span,

a reel with a supply of filamentary wire material mounted for rotation about its axis, and



means for orbiting said reel about an axis tangent to said core ring with the axis of said reel parallel to a fixed reference line,

whereby as said core ring is revolved, said filamentary material is progressively fed from said reel and helically wrapped around the surface of the free circumferential section of said core ring.

3,966,132

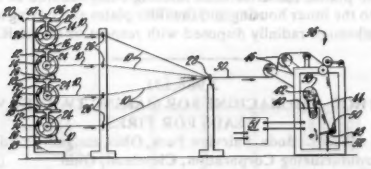
APPARATUS FOR AND METHOD OF HANDLING LINEAR ELEMENTS

Robert J. Gelin, Newark, Ohio, and James E. Bartlett, Big Pine Key, Fla., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 348,343, April 5, 1973, abandoned. This application Aug. 1, 1974, Ser. No. 493,580

Int. Cl.² B65H *63/00*

U.S. Cl. 242—36 11 Claims



1. The method of handling a linear bundle of filaments comprising:

linearly advancing the bundle along a given path such that the bundle vibrates with a varying frequency in response to changes in the linear speed and tension of the advancing bundle;

sensing the frequency of the vibrations of the advancing bundle;

supplying an electrical signal having a fixed amplitude and a varying frequency corresponding to the frequency of the vibrations of the advancing bundle; and

controlling advancement of the linear bundle in response to the varying frequency of the electrical signal.

3,966,133

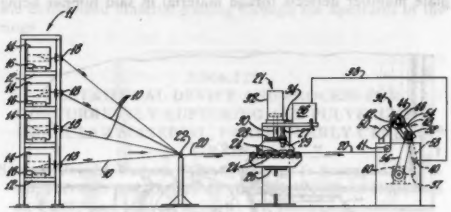
TENSION CONTROLLING APPARATUS

Robert J. Gelin, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 23, 1974, Ser. No. 535,621

Int. Cl.² B65H *54/02, 59/30, 77/00*

U.S. Cl. 242—42 5 Claims



1. Apparatus for packaging roving from a plurality of continuous glass strands comprising:

a plurality of glass strand serving packages each mounted for linear withdrawal of a strand from one end thereof;

a rotatable collector spaced from the serving packages upon which the roving is wound as a package;

means for rotating the collector including speed control means for varying the angular speed of the collector during package collection so that the roving is wound at a constant linear collection speed, the speed control means including an electrical means effective to provide an electrical signal which varies in response to the changes of the diameter of the package during package collection;

gathering means between the packages and the collector for combining the strands into the roving;

means for tensioning the roving along its path to the collector including a first bar and a second bar in spaced relation located at opposite sides of the path and upon which the roving is turned during its travel along the path to the collector; and

means for controlling the tension in the roving including means for holding the first bar on a fixed axis, pneumatic means including an air cylinder for movably holding the second bar in a biased relationship with the roving so that changes in the disposition of the second bar modifies the turning of the roving upon the bars to modify the tension in the roving, and a pressure control for regulating the air pressure in the cylinder, such control including means for sensing the varying electrical signal from the electrical means and for regulating the air pressure in response to the sensed signal.

3,966,134

CASSETTE FOR AN ENDLESS TYPE CINEFILM

Yasuhisa Matsuda, Mitaka, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Dec. 3, 1973, Ser. No. 421,101

Claims priority, application Japan, Dec. 11, 1972, 47-142218[U]

Int. Cl.² B65H *17/48*

U.S. Cl. 242—55.19 A 5 Claims

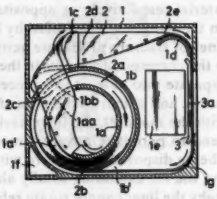
1. A cassette for an endless type film comprising:

a rectangular casing for housing therein said film coiled to form windings, said casing comprising a bottom wall, four side walls connected to the bottom wall, and a top wall, said top and bottom walls being separated by a distance substantially equal to the sum of the width of the film plus the thickness of the film, the casing further comprising

a film gate formed in a side wall of said casing oriented for the projection or the exposure of the portion of said film fed out of said windings and guided to pass across said film gate,

an annular inner guide ring secured to said casing for positioning and guiding the innermost winding of said film located around said inner guide ring, the inner guide ring having an outlet cut-out portion for feeding therethrough the terminal portion of the innermost winding of said film inwardly of said inner guide ring,

an annular outer guide ring secured to said casing and arranged around said inner guide ring substantially concentrically therewith and spaced a distance therefrom so that the windings of said film located around said inner guide ring are held within said outer guide ring, said outer guide ring having an inlet cut-out portion for receiving therethrough the foremost portion of said film which has been fed across said film gate into the interior of said outer guide ring to merge into the outermost winding of said film, said inner guide ring and said outer guide ring each having a shallow depression remote from said outlet cut-out portion of said inner guide ring for twisting that portion of the film fed out of said outlet cut-out portion by 90° as the film is advanced across said inner and outer guide rings,



a guide means for guiding said film fed out of said outlet cut-out portion of said inner guide ring across said inner and outer guide rings, said guide means being supported at a portion of said casing exteriorly of said outer guide ring adjacent to the position at which said portion of said film fed out of said inner guide ring moves across said inner and outer guide rings, the outer surface of said guide means being oriented obliquely with respect to the direction of movement of said film moving across said inner and outer guide rings, for twisting the portion of said film guided over said outer surface of said guide means by 180° in the same direction as the said twisting of 90°, the direction of movement of said portion of said film guided over said outer surface of said guide means being turned substantially at right angles, and

a further guide member for guiding said film from said guide means to said film gate and twisting said film by 90° in the same direction as the twisting of 180° effected by said guide means thereby causing said film to execute a 360° twist between being fed out of said inner guide ring and being moved across said film gate, then to be advanced to said inlet cut-out portion of said outlet guide ring so as to merge into the outermost winding of said film.

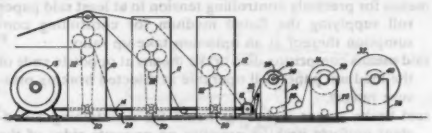
3,966,135

NEWSPRINT REWINDER

Bill Baker, 2723 Copeland Road, Tyler, Tex. 75701, and Frank Patterson, 608 Hood, Palestine, Tex. 75801

Filed Feb. 18, 1975, Ser. No. 550,184
Int. Cl.² B65H *19/18*
U.S. Cl. 242—58.1 **9 Claims**

1. In a printing press having a plurality of presses for simultaneously printing a plurality of paper webs and power train means for transmitting power to the presses, apparatus for supplying paper to the presses with said apparatus comprising a plurality of paper roll supports with at least one support including a rotatable shaft, and means for coupling said one roll support rotatable shaft with said power train means for



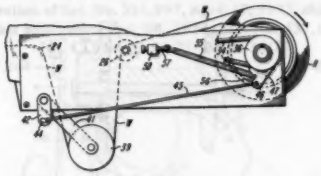
winding paper onto the one roll support from another of the roll supports.

3,966,136

REWIND APPARATUS

John T. Newberry, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed May 13, 1974, Ser. No. 469,146
Int. Cl.² B65H *17/04, 25/00*
U.S. Cl. 242—67.1 R **19 Claims**



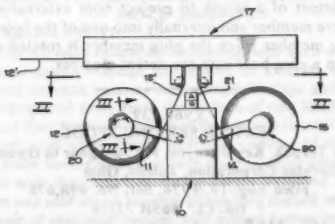
1. Apparatus for rewinding a web, comprising: a rotatably mounted shaft, first and second sleeves rotatably received on the shaft, means for continuously driving the first sleeve, the first and second sleeves having respective first and second cam surfaces, the cam surfaces being cooperable to cause the first sleeve to skew slightly on the shaft to cause the first sleeve to clutch the shaft, a hub driven by the shaft onto which a web can be wound, web tension sensing means responsive to tautness and slack in the web, and actuating means controlled by the sensing means for effecting movement of the cam surfaces of the first and second sleeves into cooperation when slack exists in the web and for effecting movement of the cam surfaces out of cooperation when tautness exists in the web.

3,966,137

METHOD AND APPARATUS FOR CONTROLLING WEB TENSION

Jerome E. Schuessler, Fullerton, Calif., assignor to Jeroll Mfg. Co., North Hollywood, Calif.

Filed Mar. 27, 1975, Ser. No. 562,562
Int. Cl.² B65H *25/22*
U.S. Cl. 242—75.43 **11 Claims**



6. In an apparatus for making corrugated board in which a paper liner is joined with a fluted paper medium, the paper liner and medium being drawn from separate paper stock

rolls, the amount of paper medium fluted for each unit amount of unfluted liner consumed being expressed as take-up ratio, the provision of:

means for precisely controlling tension in at least said paper roll supplying the fluted medium for controlling consumption thereof at an optimum take-up ratio;

said means comprising disc brake means at opposite ends of the medium paper roll operable at selected braking pressure ranges,

said brake means including means for maintaining a constant uniform braking pressure on opposite sides of the medium paper roll,

said latter means including a self-regulating fluid brake system.

3,966,138

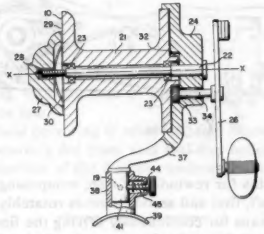
CASTING FISHING REEL

August P. Gelardi, Pacifica, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 14, 1975, Ser. No. 541,013

Int. Cl.² A01K *89/04*

U.S. Cl. 242—84.2 B **3 Claims**



1. A fishing reel fitted with a support arm for fastening to a fishing rod, with means to rotate the reel in the attached position to a first position in which axis of the spindle of the reel is oriented parallel to the axis of the rod for casting purposes, or alternately to rotate the reel to a second position in which the axis of the spindle of the reel is oriented perpendicular to the axis of the rod for reeling purposes,

said means serving to positively latch the reel in either the said first position or the said second position, with the support arm of the reel formed with a cylindrical plug member rotationally engaged in a sleeve member fitted to a member that is attachable to a fishing rod,

said cylindrical plug member formed with a pair of recessed holes, the axes of which are in a common plane, perpendicular to each other and perpendicular to the axis of the cylindrical plug member, with said sleeve member fitted with a detent member slidably mounted on a through hole of the sleeve member, the axis of said detent and hole being in the plane of the axes of the holes in the plug in the assembled mode,

said detent of a length to project both externally of the sleeve member and internally into one of the holes of the plug member when the plug member is rotated so as to align a plug hole with the detent member.

3,966,139

TEXTILE SERVING SPOOL

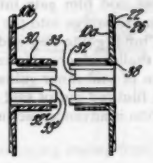
Anthony Terpak, Key Biscayne, Fla., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 19, 1974, Ser. No. 498,676

Int. Cl.² B65H *75/14*

U.S. Cl. 242—118.7 **6 Claims**

1. A textile serving spool for supporting a strand or yarn wound thereon and adapted for mounting on a rotatable mandrel and for serving the strand or yarn about a continuous object passing axially through the center of the mandrel, the spool comprising a hollow cylindrical core and a pair of integral annular flanges respectively at opposite ends of the core, the core and flanges being made of breakable material, each of the flanges having grooves in its surface extending between inner and outer peripheries thereof and corresponding to like grooves in the opposite flange to form pairs of grooves, the core having a slot for each pair of grooves, and having a rib extending axially along the interior thereof, each slot extending radially through the wall of the core and axially along the core between corresponding grooves but terminating a short



distance from each of the flanges to leave continuums of breakable material respectively at opposite ends of the core whereby when the flanges are fractured by breaking along the grooves the lines of fracture propagate across the continuums of material to the corresponding slots in the core and the core and flanges separate into at least two pieces for easy removal from the mandrel, and a liner in the core effective to frictionally engage with the mandrel, the liner having a slit extending from end to end to permit removal thereof from around the mandrel and being disposed in the core with the slit cooperatively engaging the rib extending axially along the interior of the core whereby the liner cannot rotate relatively to the core.

3,966,140

FISHING REEL

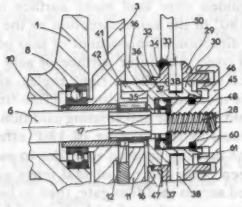
Andre Coquelet, and Alain Nepote, both of Cluses, France, assignors to Mitchell S.A., France

Filed June 30, 1975, Ser. No. 591,649

Claims priority, application France, July 18, 1974, 74.25043

Int. Cl.² A01K *89/02*

U.S. Cl. 242—217 **2 Claims**

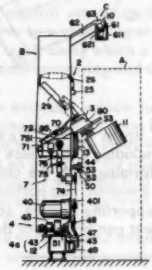


1. In a fishing reel of the type comprising a rotatable spool disposed between two supports, a spool-braking device disposed coaxial to the spool and being actuable by an intermediate element also coaxial to the spool and movable by an axial traction exerted by a control member which is movable angularly but not axially, this control member including an abutment face disposed facing the outer face of one of the supports and at least one profiled part cooperating with a member of complementary profile angularly but not axially fixed on said support, the improvement wherein said control member and said member of complementary profile are retained axially on an end of the intermediate element extending beyond said one support solely by a common removable retaining member disposed on said end.

3,966,141
APPARATUS FOR PROCESSING YARN END OF COPS SUPPLIED TO THE WINDER

Shigeyuki Nishiyama, Amagasaki; Kotaro Tsurumi, Takatsuki, and Katsuaki Yoshimura, Amagasaki, all of Japan, assignors to Nihon Spindle Seizo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1973, Ser. No. 407,349
Claims priority, application Japan, Oct. 17, 1972, 47-104117; Oct. 17, 1972, 47-104118; Nov. 28, 1972, 47-119618; Mar. 13, 1973, 48-31591[U]
Int. Cl.[2] B65H *54/26*
U.S. Cl. 242—35.5 A 21 Claims



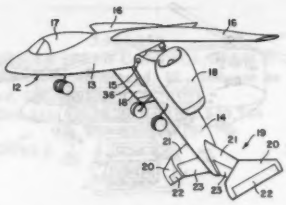
1. An apparatus for processing yarn ends of cops to be supplied to a plurality of winder units comprising in combination, a magazine associated with each winder unit for receiving said cops, said magazines each including suction means for supplying yarn to the associated winding units; cop feeder means adapted to move along a path including a position in registration with each of said magazines, said cop feeder means including means for stopping said cop feeder means at each of said registration positions, and charging means automatically supplying cops to each of said magazines to dispose same therein when said feeder means is at each said registration position; yarn draw-out means for removing the yarn wound on said cops and drawing out the yarn end; yarn guide means for engaging the yarn extended between said yarn draw-out means and the cop disposed in said magazine to guide the yarn into proximity with said magazine suction means; and yarn cutting means for cutting the yarn gripped by said suction means in a position intermediate said suction means and said yarn draw-out means.

3,966,142
VERTICAL TAKEOFF AND LANDING AIRCRAFT

Marshall J. Corbett, Centerport, and Robert W. Kress, Lloyd Harbor, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Mar. 6, 1975, Ser. No. 556,095
Int. Cl.[2] B64C *1/30*
U.S. Cl. 244—12 A 21 Claims

1. An aircraft having a fuselage, wings, empennage and propulsion means,
said wings being attached to said fuselage,
said propulsion means producing a thrust,
means for rotating said thrust with respect to said wings and said fuselage,
said empennage being rotatable as a unit with respect to said fuselage,
wherein said empennage rotates in concert with the rotation

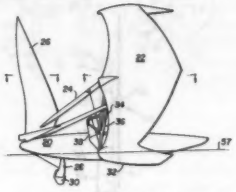


of said thrust whereby the efflux of said propulsion means is directed at and impinges on said empennage.

3,966,143
SELF-LAUNCHING GLIDER

Gordon R. Smith, 4 Summit Terrace, Sparta, N.J. 07871

Continuation of Ser. No. 351,997, April 17, 1973, abandoned.
This application Jan. 28, 1974, Ser. No. 437,187
Int. Cl.[2] B64C *31/02*; B63B *35/72*
U.S. Cl. 244—16 37 Claims



32. An amphibious glider, operable in both a surface mode and capable of self-launching into a gliding mode, comprising,
a hull;
an aerodynamic wing mounted on said hull, said aerodynamic wing including means for stabilizing said glider when operating in said surface mode, said means for stabilizing said glider disposed at the ends of said aerodynamic wing; and
a hydrofoil mounted with respect to said hull, said hydrofoil being capable of hydrodynamic direction control.

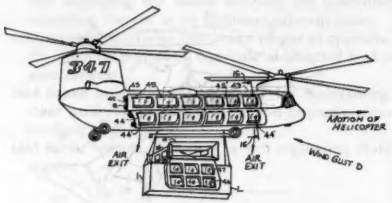
3,966,144
DUCT SYSTEM FOR WIND GUST ALLEVIATION OF AIRCRAFT AND SUSPENDED CONTAINERIZED LOADS

Edwin Zenith Gabriel, 318-B South St., Eatontown, N.J. 07724

Continuation-in-part of Ser. No. 420,154, Nov. 29, 1973, abandoned. This application June 30, 1975, Ser. No. 584,585
Int. Cl.[2] B64D *47/00*
U.S. Cl. 244—17.11 4 Claims

1. An air duct system for mounting onto each exterior side of an aircraft's fuselage and having an exterior wall and an interior on each exterior side of said fuselage and supported by and spaced away from the surface of said fuselage so that air can flow between said duct system exterior walls and said surface, said walls shaped to follow contour of said surface, said walls having openings over most of their area and being fitted with doors having spring-hinges mounted above said doors and said doors capable of opening inward only into the interior of said duct system, said system having top, bottom, forward and rear sides and having openings on said sides for expelling air entering said system interior so that when a wind gust blows against the side of said fuselage said doors open and said system allows the air entering to be blown out through

said sides, the majority of said air being blown out through said bottom side by virtue of said hinges being mounted above



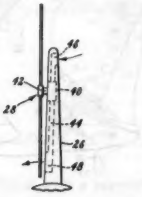
said doors, and said duct system provided with means for fastening onto the surface of said fuselage.

3,966,145

STRUCTURE FOR COOLING HELICOPTER TAIL ROTOR GEARBOX

Robert Wiesner, Broomall, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 28, 1975, Ser. No. 554,296
Int. Cl.² B64D *33/10*
U.S. Cl. 244—17.11 **3 Claims**



1. In a helicopter comprising a fuselage, a rotary wing system and a vertical stabilizer comprising a spar, a first skin connected to said spar and forming one side of said stabilizer and a second skin connected to said spar and forming the other side of said stabilizer, the combination of an anti-torque tail rotor and cooling system comprising a tail rotor connected to said vertical stabilizer, a gear box located within said stabilizer and operably connected to said tail rotor, an air passage located within said stabilizer and in communication with said gear box, wherein said air passage is formed by said spar, said first skin and said second skin air inlet means located in the vertical stabilizer and at one end of said passage, air outlet means located in said stabilizer and located at the other end of said passage, whereby cooling air flows into said inlet means through said passage and about said gear box, and out/said outlet means upon rotation of said tail rotor.

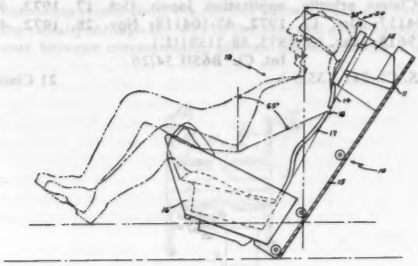
3,966,146

AIR BLADDER SEAT CUSHION FOR HIGH ACCELERATION COCKPIT

Edward O. Roberts, Xenia, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 10, 1975, Ser. No. 556,987
Int. Cl.² B64D *25/04*
U.S. Cl. 244—122 A **3 Claims**

1. In an aircraft ejection seat having a seat pan portion and a seat back portion rigidly mounted thereto at a predetermined minimum backward tilt angle; a pneumatically-operable, inflatable, air bladder cushion pad element disposed in supporting relation with the said seat pan and seat back portions, and adjustable between a first, deflated position against and acting as a part of the padding of the ejection seat and a second, inflated position with an upper surface portion thereof being disposed upwardly against and effectively forming a new back supporting surface for, and automatically tilting the occupant of the seat at a substantially increased and predetermined maximum angle of backward tilt towards the supine position for a significantly increased tolerance to sustained



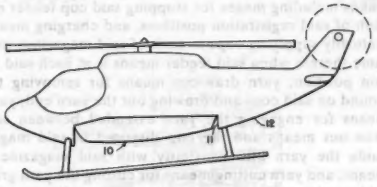
acceleration levels of up to 10 to 12 *g*'s; said air bladder cushion pad element including a first, back supporting portion attached to, and conforming with the configuration of, the seat back portion; and a second, seat portion integrally formed with said first, back supporting portion, and attached to and conforming with the seat pan portion of the ejection seat.

3,966,147

HAMMOCK SUPPORTED FUEL TANK

Joseph N. Wittko, Old Westbury, N.Y.; David G. Harding, Brookhaven, Pa.; John J. Schneider, Media, Pa., and Joseph E. Gonsalves, Springfield, Pa., assignors to Grumman Aerospace Corporation, Bethpage, N.Y. and The Boeing Company, Seattle, Wash.

Filed Nov. 26, 1974, Ser. No. 527,338
Int. Cl.² B64D *37/04*
U.S. Cl. 244—135 B **3 Claims**



1. In an aircraft, a fuel cell fabricated of self-sealing material having:

a substantially flat top surface for nesting under and against a substantially flat external bottom surface of the aircraft and having sides and a bottom shaped in the form of a shallow catenary, and

means for supporting the fuel cell comprising:

a bar member extending the length of the fuel cell on both sides thereof and extending across the front and rear of the fuel cell,

hinge means for releasably attaching said bar member to the bottom surface of the aircraft,

means provided on said bar member for securing thereto the fuel cell, and

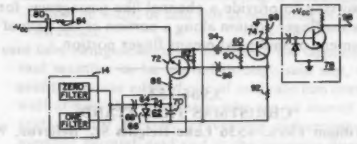
a fabric hammock attached to said bar member, said hammock engaging about and conforming to the shape of said fuel cell to confine and support it from said bar member.

3,966,148

SIGNAL THRESHOLD RESPONSIVE APPARATUS

Arun P. Sahasrabudhe, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 15, 1975, Ser. No. 568,225
Int. Cl.² B61L 21/06
U.S. Cl. 246—34 R 7 Claims



1. In a vehicle control system including signal threshold apparatus responsive to a coded input signal provided within a signal block of a track along which a vehicle is operative for controlling the vehicle occupying said signal block, the combination comprising

means operative with said vehicle for providing a first output signal having an energy level in accordance with the energy level of said coded input signal,

means including an oscillator for providing a second output signal in accordance with said first output signal having at least a predetermined energy level at which said oscillator will oscillate, and

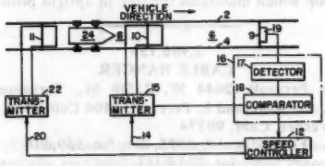
means responsive to the second output signal for controlling the operation of said vehicle within said signal block.

3,966,149

QUAD STATE RECEIVER

Thomas C. Matty, North Huntingdon, and Arun P. Sahasrabudhe, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburg, Pa.

Filed Mar. 13, 1975, Ser. No. 558,097
Int. Cl.² B61L 21/06
U.S. Cl. 246—34 R 17 Claims



1. In a transportation vehicle detection system which compares the logic conditions contained in signals transmitted at a first point with logic conditions detected from signals received at a second point, the apparatus including:

first means for filtering said received signals in relation to a first predetermined frequency;

second means for filtering said received signals in relation to a second predetermined frequency;

third means for detecting first logic conditions from said signals filtered by said first filtering means;

fourth means for detecting second logic conditions from said signals filtered by said second filtering means where said second logic conditions are complementary to said first logic conditions;

means for providing an enabling signal in relation to said first and second complementary logic conditions;

means for comparing the logic conditions in said transmitted signals with said enabling signal provided in relation to said first and second complementary logic conditions; and

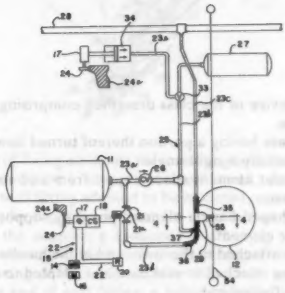
means for indicating that a vehicle has been detected between said first and second points in relation to said comparing means.

3,966,150

VEHICLE SPEED CONTROL DEVICE

William H. Peterson, Homewood, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Jan. 13, 1975, Ser. No. 540,746
Int. Cl.² B61L 3/10
U.S. Cl. 246—182 B 2 Claims



1. A vehicle speed control device for limiting the speed of a railroad car comprising

a wheel driven generator adapted to engage a wheel of the railroad car,

a speed responsive switch attached to said generator,

magnetically operated switch means,

tripping means mounted off the railroad car to actuate the magnetically operated switch means,

a first reservoir tank of fluid under a vacuum,

shuttle valve means,

speed control valve means connected to the first reservoir and the shuttle valve means, and actuated by the generator through the speed responsive switch and the magnetically operated switch means to selectively supply fluid under a vacuum from the first reservoir to the shuttle valve means,

a second reservoir tank of fluid under a vacuum,

a trainline of fluid under a vacuum connected to charge both said first and second reservoir tanks with a vacuum,

car wheel brakes,

a brake cylinder for operating the car wheel brakes, said brake cylinder having a piston therein, and

ball valve means mounted on the shuttle valve means which is mounted on the brake cylinder,

said shuttle valve means and said ball valve means having a first common passage communicating with one side of the piston in said brake cylinder for introducing a vacuum into said brake cylinder and having a second common passage for introducing atmospheric pressure to the other side of said piston in said brake cylinder,

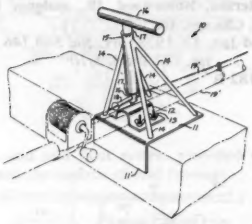
said shuttle valve means responsive to the fluid pressure from both said speed control valve and from said ball valve means to selectively supply vacuum to said brake cylinder either from said first reservoir through said speed control valves or from said reservoir through said ball valve means.

3,966,151

BOTTOM FISHING DEVICE

Carl V. Hawkins, III, 18801 Vicci St., Canyon Country, Calif. 91351

Filed Jan. 18, 1974, Ser. No. 434,553
Int. Cl.² A01R 97/10; A01K 97/10
U.S. Cl. 43—21.2 1 Claim



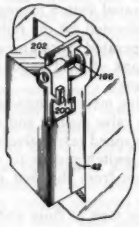
1. In a device of the class described comprising,
a. A Base.
b. Said base having a portion thereof turned downwardly at substantially a right angle.
c. A tubular element spaced apart from and supported by said base.
d. A T-shaped handle element pivotally supported by said tubular element.
e. A tube attached to the lower end of the handle element.
f. A clamp attached to said base and adapted to receive and hold a fishing rod.

3,966,152

ELECTRICAL RECEPTACLE

Menashe Bromberg, West Orange, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Division of Ser. No. 512,414, Oct. 7, 1974. This application Apr. 14, 1975, Ser. No. 567,540
Int. Cl.² H02G 3/08, 3/18, 3/12
U.S. Cl. 248—27 R 2 Claims



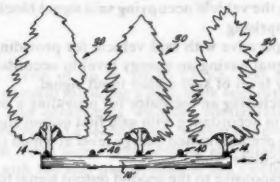
1. Mounting means for an electrical receptacle having an enclosed body member, a base portion integrally joined to said body member and having a flanged portion extending beyond the periphery of said body member, said mounting means comprising: pawl means rotatably connected to said flanged portion and having a finger portion movable from a first position within the confines of the outer periphery of said body member to a second position beyond the confines of the outer periphery of said body member; means for rotatably deploying said pawl means finger portion from said first position to said second position; means for displacing said pawl means along an axis generally normal to the plane of said base member flanged portion adjacent said body member; and means for selectively restraining the rotational movement of said pawl means along a given portion of its length of axial displacement, said restraining means comprising a first planar pawl stop and a second planar pawl stop, said first pawl stop extending rearwardly from said base member flanged portion parallel to the path of axial displacement of said pawl means finger portion for stopping said pawl means in said second position, said second pawl stop being shorter than said first pawl stop and extending rearwardly from said base member flanged portion generally parallel to a portion of the path of axial displacement of said pawl means finger portion and lying in a plane generally parallel to and spaced from the plane of said first pawl stop to provide a channel-like passageway for said pawl means finger portion along a portion of the path of axial displacement of said pawl means finger portion.

3,966,153

CHRISTMAS TREE STAND

Jack William Fleck, 4536 Lake Heights St., Bellevue, Wash. 98004

Filed July 19, 1972, Ser. No. 273,266
Int. Cl.² A47G 33/12
U.S. Cl. 248—512 9 Claims



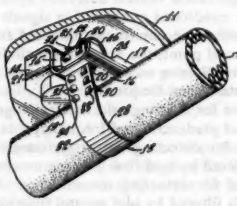
1. A Christmas tree stand for use with a Christmas tree having a headed nail-like element driven partially into the side of the tree trunk a small fractional part of its length above the butt end thereof, said stand comprising a bottom member having an upwardly pointed prong adapted to impale the butt end of the Christmas tree, an upper member having an upwardly open slot extending generally vertically adapted to slidably receive and retain the nail-like element with the head of the nail on one side and the side of the tree trunk on the opposite side of said slotted upper member, and means interconnecting the bottom and upper members in fixed positional relationship which maintains the tree in upright position.

3,966,154

CABLE HANGER

Frederick Perrault, 2644 W. 225th St., Torrance, Calif. 90505, and Raymond E. Perrault, 2404 Colt Road, Rancho Palos Verdes, Calif. 90274

Filed Mar. 19, 1975, Ser. No. 559,808
Int. Cl.² F16L 3/04
U.S. Cl. 248—62 15 Claims



1. A supporting device comprising:
a bracket adapted for attachment to a structural element, said bracket including a wall having at least one slot therein,
and a strap defined by an elongated flat member of resilient material, said member having opposite longitudinal edges,

said member including a plurality of tabs projecting outwardly from one principal surface thereof,

each of said tabs having a free transverse edge facing one end of said elongated member,

and a free generally longitudinal edge spaced inwardly from and facing one of said longitudinal edges of said member, the remaining edges of each of said tabs being connected to said member,

said member at said tabs having a thickness greater than the width of said slot as measured in at least one direction,

said tabs being deflectable to enable the opposite end of said member to be moved through said slot, whereby said transverse edge of one of said tabs can overlap said wall at said slot when said tabs are so moved through said slot for thereby preventing movement of said member through said slot in the opposite direction,

said member and said bracket including means for attaching said one end of said member to said bracket.

3,966,155

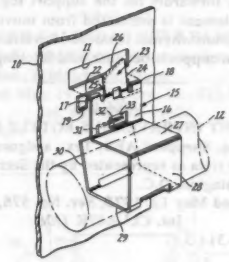
CLIP FOR REMOTE CONTROL ROD

Engel A. Meyer, Bloomfield Hills, Mich., assignor to USM Corporation, Boston, Mass.

Filed Feb. 10, 1975, Ser. No. 548,833

Int. Cl.² F16L 3/08

U.S. Cl. 248—73 **7 Claims**



1. A clip for retaining an element adjacent a panel having a substantially rectangular opening provided therein for engagement with the clip, said clip comprising a base portion having a substantially planar rear surface to be located adjacent the panel, a pair of spaced means disposed at the top of said base portion for gripping the lower edge of the panel opening, means disposed between said gripping means for engaging the upper edge of said panel opening providing interfering engagement between said gripping means and said engaging means, and said lower and upper panel opening edges respectively, and means connected to said base for enclosing an element received therein to limit lateral displacement of the element, said enclosing means comprising a box-shaped structure having one wall thereof disposed adjacent to and in parallel relation with the front surface of the panel, said wall being separable from said box structure at the upper corner thereof, an opening formed in said clip element adjacent said corner of said box-shaped structure and a tab extending from said wall structure and into said opening adjacent said corner to enclose the element within the box-shaped structure whereby said one wall is inseparable from said box structure with said clip engaged in the panel rectangular opening.

3,966,156

SET OF FIXING ELEMENTS FOR MOUNTING RADIATORS OR LIKE BODIES ON WALLS

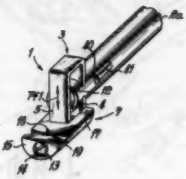
Albert Frischmann, Freiburg; Kurt Mermi, Emmendingen; Rainer Hermeneit, Freiburg, and Rudolf Königer, Buchholz-Batzenhausle, all of Germany, assignors to Upat-Max Langensiepen KG, Emmendingen, Germany

Filed May 6, 1974, Ser. No. 467,275

Claims priority, application Germany, May 7, 1973, 7317049[U]; May 7, 1973, 7317102[U]; Sept. 28, 1973, 7335061[U]; Mar. 11, 1974, 2411577

Int. Cl.² F28F 9/26

U.S. Cl. 248—201 **27 Claims**



1. A set of fixing elements for mounting structures, particularly radiators, on a support such as a wall, comprising an elongated wall fitting adapted to be mounted on a support, the wall fitting having a transverse slot at its end projecting outwardly of the support; a U-shaped clip having a first shank slidably mounted in the transverse slot and a second shank said clip being deformable so as to move said second shank against the end of said fitting; a holder adapted to support a structure and being connected with the clip so as to move with the latter and thereby adjust the position of the holder relative to the wall fitting; and clamping means for drawing the shanks towards each other and for clamping the second shank against the projecting end of the wall fitting so as to securely fix the holder to the wall fitting.

3,966,157

HEAVY WEIGHT HANGER

Jose Corral, and George Spector, both c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Nov. 6, 1973, Ser. No. 413,315

Int. Cl.² A47G 1/16

U.S. Cl. 248—217 **1 Claim**

1. A wall hanger of generally triangular shape having an upper wide portion with symmetrical spaced end prongs and a tapered narrow lower apex portion having a point, including a lower prong, vertically beneath and horizontally midway between the end prongs in combination with a U-shaped hook to support an object to be hung thereon, wherein said hook is disposed integrally at the same apex portion below the lower prong and having an outer end spaced from a wall support when said prongs are driven into said wall support, wherein the upper portion is pivotally connected to the apex portion at said outer end of the hook, said lower prong forming an integral transverse projection extending from the hook away towards the wall support and away from the said outer end of

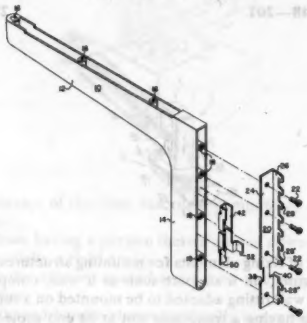
the hook, whereby the said upper portion encloses the hook and is spaced from the wall when mounted.

3,966,158

CANTILEVER LOCK

Bruce K. Boundy, Holland, Mich., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 7, 1975, Ser. No. 548,128
Int. Cl.² A47G *29/02*
U.S. Cl. 248—243 **5 Claims**



1. In combination, a support bracket locking mechanism and cantilever support bracket for locking the cantilever support bracket to a slotted standard, said cantilever support bracket including an L-shaped mounting bracket attached to one edge thereof, said L-shaped mounting bracket including a plurality of spaced vertically aligned hook shaped connectors extending therefrom adapted to interconnect with a plurality of spaced slots in said slotted standard, said locking mechanism comprising; a locking member associated with said L-shaped mounting bracket and including a locking tab and an actuating tab, said locking tab constructed and arranged to extend into one of said slots in said slotted standard in place of one of said hook connectors, said actuating tab being movable with respect to said locking tab and said locking member being slidably movable, with respect to said mounting bracket, from a locked position to an unlocked position whereby said locking tab will be caused to move in response to said slidable movement of said locking member from an unlocked position equidistant between two adjacent hook connectors to a locked position closer to one of said adjacent hook connectors.

3,966,159

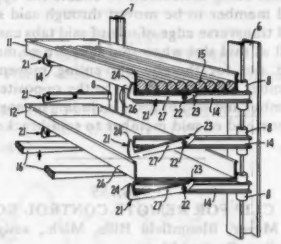
SAFETY LATCH FOR TRAYS

Peter Brown, 2731 26th Ave., Oakland, Calif. 94601

Filed May 19, 1975, Ser. No. 578,507
Int. Cl.² A47G *29/02*; E04G *3/08*
U.S. Cl. 248—250 **1 Claim**

1. A device for retaining a tray in position on two spaced horizontal U-shaped supports, each support having a top leg and a bottom leg spaced from the top leg to define an opening therebetween, comprising:

a latching element pivotally attached to one of the horizontal supports, said latching element having an elongated body disposed in front of the opening in the U-shaped support, an upwardly projecting cam element on one end of said elongated body for engaging the undersurface of a tray supported on the top legs of the supports, a tray end engaging element on the other end of said elongated body having a flat face presented inwardly toward said elongated body and oriented perpendicularly thereof, said tray end engaging element projecting upwardly from said body a distance slightly less than the thickness of the tray for engaging a forward edge of the tray supported on the supports to prevent that tray from sliding forwardly when it is being supported on the supports, said flat face being perpendicularly disposed to the support top leg when the tray is supported on that top leg, a pivot pin extending through said elongated body to attach said body to the support so that it is located within the U-shaped support opening, said pivot pin being located near said body one end so that said pivot pin is spaced from said engaging element a distance which greatly exceeds that distance said pivot pin is spaced from said cam element; and a stop



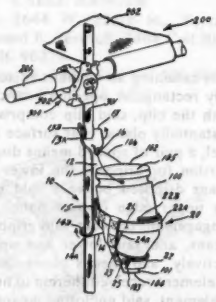
pin on said body between said engaging element and said pivot pin for engaging the support bottom leg so that when the tray is removed from engagement with said cam element said elongated body pivots about said pivot pin and said tray end engaging element moves downwardly to a position just below the support top leg so that the tray can move forwardly on the support top leg while said latching element is prevented from moving downwardly into a position whereat it would interfere with movement of trays on supports beneath said latching element.

3,966,160

INFLIGHT INTRAVENOUS BOTTLE HOLDER

Myrl E. Wilson, Sheppard AFB, Tex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 12, 1975, Ser. No. 576,504
Int. Cl.² A47K *1/08*
U.S. Cl. 248—311.3 **3 Claims**



1. A bottle holder assembly, adapted for use as an inflight holder of an intravenous bottle aboard an aircraft, wherein said aircraft is equipped with conventional litters and litter support straps, and wherein said intravenous bottle is of the conventional type having two ends, with a neck and an outlet at one end, and with a bottom and a bail at the other end, comprising:

a. a cradle generally configurated in the form of an inverted T, wherein said T has a vertical leg with an upper end and

a lower end, and a horizontal leg, and wherein said cradle is suitably configurated and dimensioned so as to be removably attachable to, and slideably movable along, any one of said litter support straps;

b. a hook releasably connected to said upper end of said vertical leg of said inverted T-shaped cradle, wherein said hook is suitably configurated and dimensioned to accept and to hold said bale of said intravenous bottle when said bottle is in an inverted position;

c. and, a strap subassembly removably attached to said cradle and suitably configurated and dimensioned to accept, and to assist in holding and in supporting, said intravenous bottle at said neck and outlet end when said bottle is in an inverted position, wherein said strap subassembly includes:

1. an upper strap having a first end portion and a second end portion, wherein said end portions are releasably connectable;

2. an intermediate strap having a first end portion and a second end portion, with said first and second end portions attached to said upper strap at different locations respectively, thereby causing said intermediate strap to become formed in the shape of a half-loop;

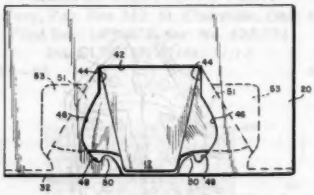
3. and, a first lower strap and a second lower strap, with each said lower strap having a first and a second end portion, and with said first end portion of said first lower strap attached to said intermediate strap, and with said second end portion of said second lower strap also attached to said intermediate strap at a different location, and also with said second end portion of said first lower strap, and said first end portion of said second lower strap releasably connectable.

3,966,161

DESK CALENDAR WITH EASEL

Gordon E. Nichols, Middleboro, Mass., assignor to Winthrop-Atkins Co., Inc., Middleboro, Mass.

Filed May 19, 1975, Ser. No. 578,809
Int. Cl.² A47B *97/04*
U.S. Cl. 248—459 **12 Claims**



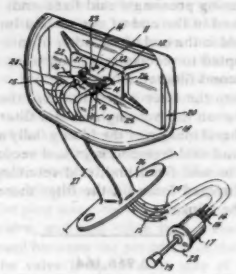
1. An easel comprising, a panel containing between its front and back surfaces a pocket, and in the back surface an opening into the pocket symmetrically disposed with respect to the pocket so that portions of the pocket extend laterally from the opposite edges of the opening, a leg member hinged at its upper end within the pocket on a hinge coinciding with the top of the opening for angular movement rearwardly from the opening and means for supporting the leg in an angular rearwardly disposed positions relative to the panel to hold the latter upright, characterized in that said means embodies articulated members slidingly engaged within the pocket at each side of the opening, said articulated members comprising proximal sections hinged at one edge to the leg adapted to be slid outwardly of the pocket and into the pocket solely by pushing and pulling the leg rearwardly and forwardly relative to the panel and distal sections hinged at one end to the outer edges of the proximal sections which remain in the pockets when the leg is pulled outwardly and which limits outward movement of the proximal sections, said distal sections being frictionally engaged within the pockets so as to retain the leg in either position.

3,966,162

REMOTE CONTROL REARVIEW MIRROR

Richard Marshall Hadley, Jackson, Tenn., assignor to Harman International Industries, Inc., Grandville, Mich.

Filed June 12, 1974, Ser. No. 478,699
Int. Cl.² A47G *1/24*
U.S. Cl. 248—487 **2 Claims**



1. An improved compression pivot structure for remote rearview mirrors and the like comprising:

a pedestal having an arcuate slot therein;

a compression pivot comprising an arm having a triangular cross section, a pair of cylindrical extensions, said cylindrical extensions forming truncated cylindrical portions at their intersections with said arm, one at each end of said arm and integral therewith, both of said extensions being on separate but parallel spaced apart axis, and each of said extensions being topped by a spherical surface having its center at or slightly above the intersection of a mirror facing apex of said triangular cross section of said arm with said extensions, and an arcuate disk integral with and extending from said arm intermediate the ends thereof, said disk having a center of arc substantially on a line passing through the centers of said spherical surfaces and in the plane including the axis of said cylindrical extension; and

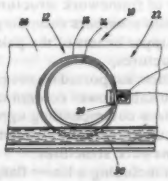
a mirror back pressed against said compression pivot member having a pair of spaced apart depressions into which said spherical extensions nestably and rockably seat, one of said depressions being a channel or slot formed in said mirror back, said slot having an axis coextensive with an axis through said spherical surfaces.

3,966,163

FILTER RETAINING LATCH

Allan R. Getzin, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed May 28, 1974, Ser. No. 473,378
Int. Cl.² B01D *39/08*; B65D *45/24*
U.S. Cl. 248—500 **2 Claims**



1. A coiled latch for locating and holding a filter in a housing, said coiled latch comprising:

a generally radially displaceable filter retaining turn adapted to be laterally spaced from the housing a distance

greater than the thickness of the filter, said retaining turn having a free end adapted to be moved between a first free position and a second filter retaining position spaced generally radially outwardly from the axis of said retaining turn from said first position;

a filter locating turn coaxially disposed to and integral with said filter retaining turn, said locating turn having a larger radii than said retaining turn, said locating turn having a fixed end, said locating turn being adapted to be attached to the housing proximate said fixed end;

a hook formed in the end of one of said turns; and

a loop formed in the end of the other of said turns, said loop being adapted to receive said hook when said free end is in said second filter retaining position;

whereby when the filter is positioned in the housing in the space between the housing and said filter retaining turn, the peripheral margin of the filter axially abuts said locating turn and said free end is in said second position and attached to said fixed end, said retaining turn exerts a radially directed force on the filter thereby holding the filter in the housing.

3,966,164

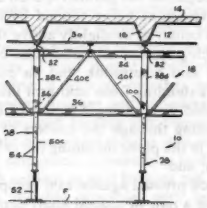
ADJUSTABLE TRUSS SUPPORT AND FORM FOR CONCRETE CONSTRUCTION

Stephen S. Dashew, Palos Verdes, Calif., assignor to Interform, Inc., Compton, Calif.

Division of Ser. No. 387,967, Aug. 13, 1973, Pat. No. 3,902,289. This application Feb. 5, 1975, Ser. No. 547,232

Int. Cl.² E04G *11/40*

U.S. Cl. 249—18 **2 Claims**



1. A concrete forming structure for forming an upper concrete floor at a distance above a lower concrete floor comprising:

a pair of elongated framework structures, each including a substantially horizontal upper beam extending along the length of the structure, a substantially horizontal lower beam below the upper beam, and a plurality of spaced tubular upper column members fixed at their upper ends to the upper beam and at their lower ends to the lower beam, said framework structures spaced from one another and extending substantially parallel to each other;

a plurality of detachable bracing members extending between the pair of framework structures;

a plurality of purlin members extending between and supported on the upper beams of the pair of laterally spaced framework structures;

a concrete floor form supported on the purlin members; and

a plurality of adjustable lower column members each slideably disposed in a corresponding upper column member to support the upper column member on a floor that lies below the framework structures;

each lower beam including a lower flange which lies below the lower ends of the upper column members; and

each lower column member is detachable from a corresponding upper column member, whereby to permit each framework structure to be rolled along the bottom of its lower beam.

3,966,165

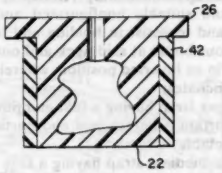
COMPOSITE FLEXIBLE MOLD

Miroslav Psensky, Cary, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Dec. 4, 1974, Ser. No. 529,334

Int. Cl.² B28B *7/06*; B29C *7/00*

U.S. Cl. 249—120 **3 Claims**



1. A composite flexible mold comprising an integral, inner, flexible, stretchable shaping element having a shaping cavity therein, for confining and shaping hardenable or otherwise curable material; and an outer second element which is a flexible, stretchable element distinct and separate from the first element, the outer element being in direct and closely confining contact with the inner element, the outer element being in a condition of stress due to stretching thereof and in which the outer element has a portion thereof having the configuration of a sleeve, and in which the outer element is stretched axially as well as circumferentially while in said direct and closely confining contact.

3,966,166

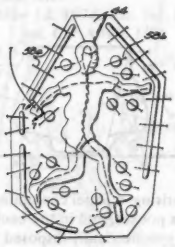
SCULPTURE MOLD

James B. Elliott, Hacienda Heights, Calif., assignor to Poly-Optics, Inc., Santa Ana, Calif.

Filed Dec. 26, 1974, Ser. No. 536,518

Int. Cl.² B29C *1/16*

U.S. Cl. 249—134 **1 Claim**



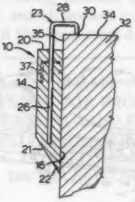
1. A mold for cast-reproduction of a three dimensional structure, comprising a pair of mold halves, each half formed of rigid polyvinyl chloride film having a thickness of **0.010 ± 0.003** inch and deformed in conformation to opposite surface contours of said structure, said halves mating along a parting line to define a mold chamber, an access opening to said chamber, and marginal regions coextending about said chamber from said parting line, said marginal regions being formed with a plurality of conjugate elongate protuberance pairs arranged tandemly substantially around said mold chamber and a plurality of conjugate conical protuberance pairs arranged between said chamber and said elongate protuberance pairs, each component of said conjugate protuberance pairs extending a substantial distance beyond said parting line a pin disposed cross-wise directly through each of said protuberance pairs for securement of said mold.

3,966,167

SIDEBOARD CONSTRUCTION

Pierre A. Vayda, Burlington, Canada, assignor to Exothermic Company of Canada Limited, Hamilton, Canada

Filed May 6, 1975, Ser. No. 574,852
Int. Cl.² B22D 7/10
U.S. Cl. 249—198 13 Claims



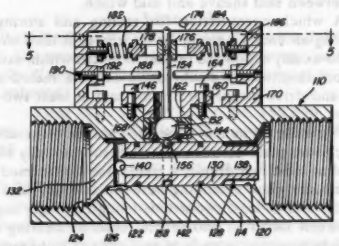
1. For use with an open-topped metal ingot mold: a sideboard comprising a body portion, a hanger rod of which part extends through said body portion, and a plate member embedded within the body portion, the plate member being oriented substantially normally to the hanger rod and having a non-circular opening with a least dimension measured in one direction and a greatest dimension measured in another direction, the rod passing through said opening and having a non-circular section at least in the region of said opening, said rod being rotatable within said opening between a first position in which it binds against edge portions of the opening and a second position in which it does not so bind, whereby the rod in said second position can be moved lengthwise through said opening, the material of the rod being softer than the material defining the opening, another part of the rod extending out of the body portion and having means for hanging the sideboard from the ingot mold.

3,966,168

PRESSURE RESPONSIVE VALVE

Francis P. Sury, P.O. Box 353, St. Clairsville, Ohio 43950

Filed Dec. 18, 1973, Ser. No. 425,774
Int. Cl.² F16K 31/44, 31/12
U.S. Cl. 251—58 6 Claims



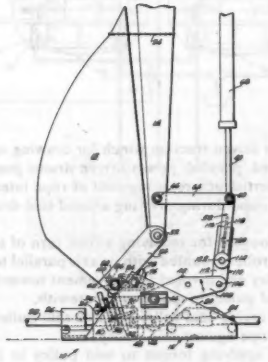
1. A valve comprising a longitudinally extending valve body disposed in a fluid flow line for controlling flow of fluid in the line, said valve body including a longitudinally extending bore therethrough forming a flow passage, a valve plug assembly longitudinally reciprocally mounted in the bore in the valve body, one end of said bore in the valve body including a valve seat, said valve plug assembly including an elongated stem slidable in the bore in the valve body and a head on one end of the stem including a valve face engageable with the valve seat on the valve body, said stem of the valve plug assembly including a longitudinal bore therein communicating with the end of the stem remote from the head, and transverse port means in the stem adjacent the head communicating the periphery of the valve stem with the bore therethrough for providing axial flow passage through the valve stem from a point adjacent the valve head whereby fluid flowing past the valve seat and valve face when spaced therefrom will flow through the port means and the bore in the valve stem, and valve actuating means isolated from contact with the flow of fluid through the valve including pivotal lever means actuating the valve plug assembly from a point intermediate the ends of the valve stem whereby the actuating means will not be in the flow path and will not be in direct contact with the material flowing past the valve, said actuating means includes an actuating stem extending generally radially from the valve stem, said actuating stem having a ball member mounted on the end portion thereof adjacent the valve stem, a projection on the ball member remote from the actuating stem, said valve stem having a peripheral groove therein receiving said projection, means sealingly mounting the ball member on the actuating stem in the valve body whereby longitudinal pivotal movement of the actuating stem will cause longitudinal reciprocation of the valve plug assembly for controlling the flow of fluid through the valve, and said valve stem includes spaced seal means interposed between the periphery of the valve stem and the bore in the valve body on each side of the groove for isolating the actuating stem from the fluid flow.

3,966,169

ROD AND PIPE PUSHER, PULLER DEVICE

William O. Schosek, P.O. Box 3626, North Fort Myers, Fla. 33903

Continuation-in-part of Ser. No. 482,275, June 24, 1974, Pat. No. 3,907,253. This application Sept. 22, 1975, Ser. No. 615,534
Int. Cl.² E21B 19/00
U.S. Cl. 254—29 R 8 Claims



1. A rod and pipe pusher, puller device for location in an operating trench adjacent to a first side of a finished surface for connection to, and operation by a conventional backhoe device, including a dipstick, to push a rod under the finished surface into a target trench located on the second side thereof, and to withdraw a pipe attached to the end of the rod in the target trench back under the finished surface to the operating trench, said device comprising,

A. a generally channel shaped main body portion including
   1. a bottom wall and
   2. a pair of spaced apart upstanding side walls;

B. a slide box, slidably journalled along said bottom wall;

C. a power arm in the form of a bell crank journalled between said side walls and including,

1. a first lever arm pivotally connected at its outer end to an extended end of a hydraulic ram piston forming a part of the backhoe device,
2. a second lever arm pivotally linked to said slide box to said slide box to impart reciprocating, back-and-forth movement thereto upon conventional operation of said ram piston;

D. drive jaw means pivotally connected within said slide box to drivingly engage a rod or pipe passing therethrough, said drive jaws including means to reverse the direction of drive thereof;

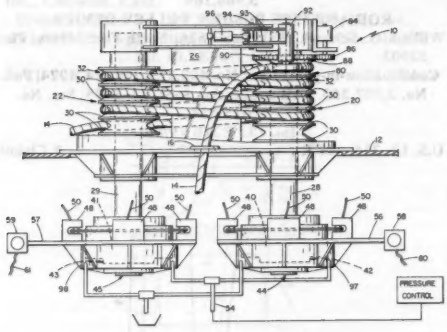
E. means to connect the conventional backhoe bucket, while it is attached to the backhoe dipstick, to the rod and pipe pusher, puller device in a spanning relation to an upper, generally central portion of said side walls.

3,966,170

TRACTION WINCH

Henry Alvin McKenna, Reston, Va., assignor to Ocean Systems, Inc., Reston, Va.

Continuation-in-part of Ser. No. 144,828, May 19, 1971, abandoned. This application Sept. 13, 1973, Ser. No. 397,108
Int. Cl.² B66D 1/76
U.S. Cl. 254—175.7 **8 Claims**



1. A power driven traction winch for drawing up rope having two spaced, parallel, power-driven drums journaled on a bearing support structure, a segment of rope intermediate its ends being wound during drawing around said drums, including

a pulley mounted for receiving a final turn of said rope,

a pressure roller mounted with its axis parallel to the axis of said pulley and pivoted for movement towards and away from said pulley in alignment therewith,

means for urging said roller towards said pulley to press a turn of rope against said pulley, and

means for applying torque to said pulley in the wind-up direction, said torque being independent of rotation of and torque applied to said drums, whereby rope is tightened into said winch under all operating conditions and released from said winch free of tension.

3. In a traction winch for drawing up rope having a plurality of parallel drums spaced apart and rotatably mounted on a support structure, a segment of rope intermediate its ends being wound during drawing around said drums, the improvement comprising

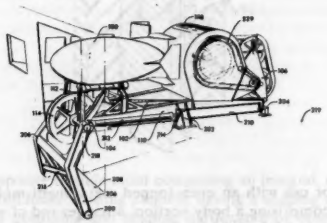
drive means applying equal torque in the take-up direction to each of said drums and being directly responsive to the rope tension between said drums while leaving said drums free to automatically accommodate to varying rope stretch by rotating at speeds differing in varying ratio responsive directly to varying rope stretch, whereby stretchable rope may be hauled in with reduced slippage.

3,966,171

APPARATUS FOR LAUNCHING TOWING AND RECOVERING A SUBMERSIBLE BODY FROM A VESSEL

Neville E. Hale, Mississauga, Canada, assignor to Fathom Oceanology Limited, Port Credit, Canada

Division of Ser. No. 327,003, Jan. 26, 1973, Pat. No. 3,782,319. This application Nov. 30, 1973, Ser. No. 420,375
Claims priority, application Canada, Feb. 29, 1972, 135768
Int. Cl.² B66D 1/36
U.S. Cl. 254—190 R **10 Claims**



1. For use in association with a winch for reeling and storing cable, where said winch is rotatable about an axis, a cable spooling assembly comprising: first arm means bearingly supported in a direction substantially perpendicular to the axis of said winch, said first arm means being rotatable about the longitudinal axis thereof; second arm means mounted at a first end of said first arm means; at least one sheave rotatably mounted on and bearingly supported by said second arm means; the arrangement being such that cable passes over said at least one sheave to reverse its direction of travel from its point of initial contact with said at least one sheave back towards a winch when cable is being reeled onto the winch said sheave being so mounted on said second arm means relative to said winch that when said cable is reeled to or unreeled from said winch, said first arm means is caused to rotate about its longitudinal axis to provide level winding means for the cable whereby said at least one sheave traverses back and forth across said winch and position said at least one sheave in an attitude relative to said winch which permits reeling the cable to or unreeling the cable from said winch at a minimum fleet angle of the cable defined between said at least one sheave and said winch, said first arm being rotatable about its longitudinal axis so as to accommodate the cable reach between said sheave and said winch.

10. A winch construction for reeling and storing cable comprising an enclosing supporting frame, at least two drum means co-axially supported by and mounted within said frame and upon which drum means cable may be reeled and unreeled; and drive means for driving said at least two drums, wherein:

said enclosing frame comprises first and second ends and an enclosure plate between said ends substantially enclosing said at least two drums; a transverse slot formed in said enclosure plate extending between said first and second ends; said at least two drums being bearingly supported between said first and second ends by bearing support means mounted in each of said ends so as to mount said drum within said enclosure plate and between said ends for rotation therein where each said drum is mounted with respect to the surrounding drum or frame by a pair of opposed circular races at each end of each such drum with bearing means between said races; and drive means for rotatably driving said at least two drums, including first sprocket means formed outwardly of one of said ends and rigidly secured to one end of the innermost of said drums, a drive sprocket, and drive transfer means between said drive sprocket and said first sprocket; and including latch means to securably latch the outermost drum against rotation with respect to said frame and further latch means to latch each drum against rotation

relative to the next adjacent drum thereto; and a transverse slot formed in each said drum except the innermost of said drums, said latch means being further adapted to secure said drums for reeling or unreeling cable onto any one of said drums, serially from the outermost drum inwardly, by aligning each of said transverse slots one with another and with the transverse slot in said enclosure plate so that with respect to any drum on which cable is being reeled or unreeled, all outward drums, if any, are latched in non-rotating position with the transverse slots in each aligned, and all inward drums, if any, are latched for rotation with the innermost drum.

3,966,172

LIGHTWEIGHT FENCE FOR PROTECTION AGAINST AIRBORNE SNOW, SAND OR THE LIKE

Herbert V. Garrett, 8112 Belleforest Drive, Vienna, Va. 22180

Filed Nov. 19, 1974, Ser. No. 525,282
Int. Cl.² E01F *7/02*
U.S. Cl. 256—12.5 **13 Claims**

1. An easily erectable-collapsible fence unit for use with snow-sand or the like, comprising a plurality of adjustable A-frames, each said A-frames comprising a pair of pivotally interconnected ground contacting posts; a plurality of strips interconnecting said A-frames, anchoring means operatively associated with said unit for maintaining the unit in erect condition, said strips being provided on each of said pivotally interconnected posts, each said strips being broad and flat, pliant and readily deformable; means adjacent the lower ends of said A-frames adjustably limiting the pivotal relation of the posts to adjust the vertical extent of the fence and establish the stability thereof and to modify the angular relation of the strips to the ground; whereby said posts may be pivotally moved toward or away from each other and said A-frames may be moved toward or away from each other.

3,966,173

MEDIAN BARRIER FOR HIGHWAYS AND THE LIKE

Ernest Glaesener, Differdange, Luxembourg, assignor to Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED, Luxembourg

Filed Mar. 18, 1975, Ser. No. 559,590
Claims priority, application Germany, Mar. 19, 1974, 2413095
Int. Cl.² A01K *3/00*; E01F *15/00*
U.S. Cl. 256—13.1 **15 Claims**

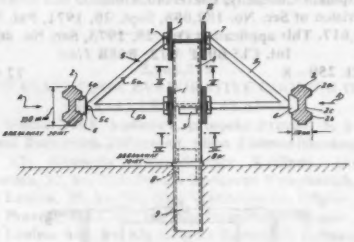
1. A roadway barrier adapted to be constructed along a travel lane for passenger and heavier vehicles, comprising:

a row of upright posts spaced apart along said lane and transversely spaced therefrom;

a substantially rigid continuous wall mounted on said posts and spaced from the proximal edge of said lane, said wall extending continuously along said row;

a guard rail positioned to intercept passenger vehicles and extending continuously along said lane between said wall and said edge, said guard rail being laterally deflectable more readily than said wall and being disposed at a height enabling it to intercept said passenger vehicles; and

spacers mounted on said wall a projecting laterally therefrom to support said guard rails at a distance of 1 to 2 meters form said wall, said wall having a heavy-vehicle intercepting portion spaced above said guard rail and lying at a level above the centers of gravity of heavy vehicles adapted to use said lane, said spacers being



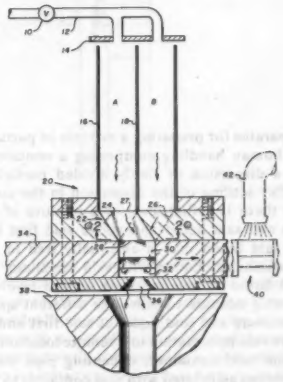
connected to said guard rails at respective breakaway portions.

3,966,174

PREMIX NOZZLE FOR KOLD BOX PROCESS

Vagn Deve, Shaker Heights, Ohio, assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 2, 1973, Ser. No. 329,007
Int. Cl.² B22C *15/24*; B01F *15/02*
U.S. Cl. 259—4 R **9 Claims**



1. A premix nozzle for kold box process comprising:

a. a mixing chamber formed by a plurality of stationary surfaces and a pair of opposite movable surfaces;

b. introduction means for introducing sand, resin and catalyst in close mixing relation into said mixing chamber;

c. an exit opening leading from said mixing chamber;

d. means for sweeping said stationary surfaces of said mixing chamber clear of residual sand by movement of one of said movable surfaces across each of said stationary surfaces; and

e. a baffle affixed to and carried between said movable surfaces, which baffle, when positioned in said chamber, induces a mixing turbulence in the flow of said sand while flowing through said chamber.

3,966,175

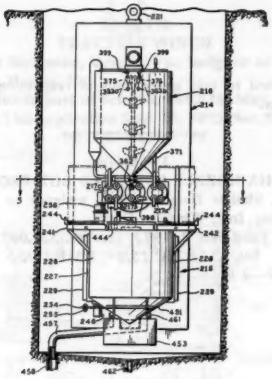
APPARATUS FOR INTRODUCING PARTICULATE MATERIAL INTO A CONTAINER

Arthur J. Stock, Lakewood; Donald E. Christofer, Willowick, and Joseph E. Brinza, Euclid, all of Ohio, assignors to Stock Equipment Company, Cleveland, Ohio

Division of Ser. No. 182,088, Sept. 20, 1971, Pat. No. 3,835,617. This application Oct. 25, 1973, Ser. No. 409,386

Int. Cl.² B01F 3/12; B65B 1/44

U.S. Cl. 259—8 12 Claims



1. Apparatus for preparing a mixture of particles in a liquid without human handling comprising a container adapted to contain a dispersion of finely divided particles in a liquid which after settling of the dispersion in the container segregates so there is a first level of a mixture of finely divided particles and said liquid and above said first level a second level of said liquid that is essentially free of said particles; sensing means associated with said container for movement into said liquid to indicate each of said levels, said sensing means being adapted to sense the different specific gravities of said mixture and said liquid at said first and second levels and to provide information to a remote location outside of and away from said container; decanting pipe means including control means associated with said container to remove excess essentially particle-free liquid therefrom and having an inlet movable in a generally upright path in the liquid in said container to remove said excess liquid from said container from only between said first and second levels; means controllable from a remote location outside and away from said container for removing excess liquid from said container through said decanting pipe to provide a desired proportion of total liquid to total particles in said container; means for mixing said liquid and said particles in said proportion in said container to form a mixture in which said particles are dispersed in said liquid; means controllable from a remote location outside of and away from said container for removing predetermined amounts of said last named mixture out of said container; and means controllable from a remote location outside of and away from said container for moving said decanting pipe inlet out of said liquid in said container to permit said mixing of said liquid and said liquid and said particles in said container.

3,966,176

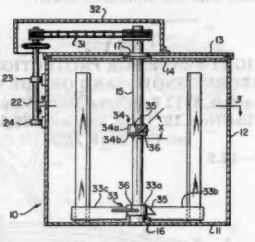
METHOD AND APPARATUS FOR PRODUCING FILLED RESINS

Ivan E. Lux, P.O. Box 26, Minden, Nebr. 68959

Filed Aug. 25, 1975, Ser. No. 607,481

Int. Cl.² B01F 7/16

U.S. Cl. 259—108 10 Claims



1. Apparatus for mixing resins and fillers comprising

a. a vertical tank having a cylindrical side wall and a flat, horizontal bottom wall;

b. a vertical rotor shaft supported in bearings carried by the tank and coaxial with the cylindrical side wall;

c. a prime mover supported on the outside of the tank and connected in driving relation with the rotor shaft to rotate the shaft in a predetermined direction;

d. a plurality of equiangularly spaced rotor blades which are fixed to the shaft, project radially therefrom, and are arranged in at least two axially spaced sets,

e. one set being located adjacent the bottom of the tank and the other being located at an intermediate elevation,

f. each rotor blade being inclined at an angle on the order of 45° with respect to the horizontal so that its leading edge in said predetermined direction of rotation is at a lower elevation than its trailing edge and the blade acts to force material in the tank in the upward direction; and

g. a plurality of imperforate, radial baffles attached to the inside of the side wall and spaced equiangularly about the axis thereof,

h. the baffles extending vertically from a region adjacent the tank bottom to an elevation spaced slightly below the top of the tank,

i. the radial width of the baffles being such that the inner margins of the baffles are closely adjacent the tips of the rotor blades.

3,966,177

FEED DEVICE FOR PLASTICS PROCESSING MACHINES

Serge Lagoutte, Chalon-sur-Saone, and Andre Lanciaux, Chatenoy-le-Royal, both of France, assignors to Societe d'Etudes Verrieres, Neuilly-sur-Seine, France

Continuation of Ser. No. 47,187, June 18, 1970, abandoned. This application Sept. 27, 1973, Ser. No. 401,443

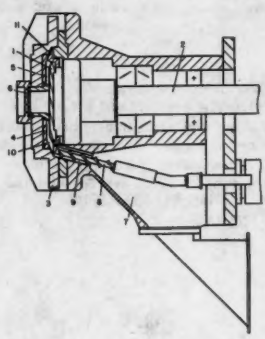
Claims priority, application France, June 19, 1969, 69.20528

Int. Cl.² B29B 1/04

U.S. Cl. 259—185 1 Claim

1. In a device for processing plastic materials including a fixed plate and a rotatable plate defining a gap therebetween, the improvement comprising an annular channel extending radially outside both the fixed plate and the rotatable plate about the gap and communicating with the gap, a metering screw to feed plastic material to the channel and a crown hook including a plurality of deflecting hooks extending radially

outwardly from the rotatable plate to sweep the annular channel through each rotation and deflect plastic material fed to



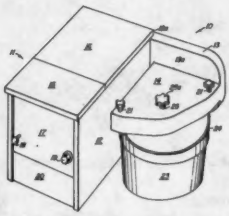
the channel to permit regular and efficient feeding of the device.

3,966,178

COMBINATION GRAIN MILL AND DOUGH MIXER

Harold E. Stevens, deceased, late of Brigham City, Utah (by Joan Stevens, heir), assignor to Mill & Mix Company, Inc., Brigham City, Utah

Filed Apr. 29, 1974, Ser. No. 464,793
Int. Cl.² A21C *1/00*; B29B *1/04*
U.S. Cl. 259—185 **8 Claims**



1. A combination grain mill and dough mixer comprising
a housing having side walls, a front wall, a rear wall, a top wall and a bottom wall;
a power source arranged in said housing producing a rotary output from a shaft thereof;
a stone grinding wheel attached to said shaft so as to turn therewith;
a fixed grinding stone, secured within said housing so as to be proximate to said grinding wheel, with grinding faces of each extending parallel to and mutually opposite to one another;
means disposed below said stone grinding wheel and and fixed grinding stone, for receiving meal falling from between said stone grinding wheel and fixed grinding stone;
means for feeding grain between said stone grinding wheel and fixed grinding stone;
means connected to said shaft for transferring power therefrom to a dough mixer;
mixer mounting means extending from a side wall of said housing on which said dough mixer is mounted said mixer mounting means comprising a mixer mounting plate extending as a shelf outwardly from said side wall and at a spaced distance above the bottom wall of said housing;
an agitator blade rotated by said power transfer means, and clamping means carried by the mixer mounting means; and
container means having a periphery arranged to be releasibly attached beneath and to be immovably clamped to said mixer mounting plate by said clamping means, with the agitator blade therein, whereby the blade can be rotated and dough mixed in the container means.

3,966,179

APPARATUS FOR EVAPORATIVE COOLING OF METALLURGICAL PLANTS

Sergei Mikhailovich Andoniev, prospekt Pravdy, 5, kv. 60; Leonid Borisovich Zilberman, ulitsa Ekonomicheskaya, 1a, kv. 12; Gennady Alexandrovich Kudinov, prospekt Gagarina, 32, kv. 203; Dorina Borisovna Kutsykovich, prospekt Lenina, 39, kv. 54; Oleg Vladimirovich Filipiev, prospekt Pravdy, 5, kv. 41; Grigory Ivanovich Kasyanov, prospekt Lenina, 64b, kv. 63; Grigory Borisovich Zalmanovich, 602 mikroraion, 33, kv. 37, and Jury Borisovich Raikovsky, prospekt Lenina, 11, kv. 34, all of Kharkov, U.S.S.R.

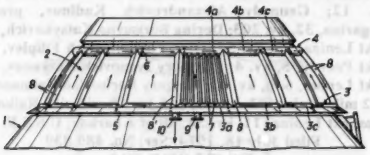
Filed July 18, 1974, Ser. No. 489,839
Int. Cl.² C21B *7/10*
U.S. Cl. 266—193 **3 Claims**

1. An apparatus for the evaporative cooling of metallurgical plants, comprising, in combination: at least one closed system for the natural circulation of cooling water, each system including an individually mountable cooler having at least two sections therein with a plurality of cooling plates including coiled pipes, intermittently connected in a substantially vertical direction by intermediate pipes, thus forming at least two separate circulation loops in said cooler sections; at least one common water-supply pipeline connected to the lower end of at least one of said cooler sections, and separate pipes connected to the upper ends of said sections for discharging a steam and water mixture; at least one common cooling-water manifold disposed above said coolers and feeding water from its lower water side through respective closable pipelines to said common supply pipelines; and steam separators arranged above said common manifold, individually for at least one group of said cooler sections; said discharging pipes leading individually to said separators; the latter being individually connected with their lower water sides to the upper steam sides of said common manifold, while upper steam outlets of said separators are similarly individually connected to a common discharging pipeline, and means for rinsing said closed system from dirt and foreign particles by passing therethrough a flow of water, including inlet and outlet valves associated with said closable pipelines and said lower ends of the cooler sections.

3,966,180
CONVERTER WITH A CONVERTER HOOD

Alexander Patuzzi; Manfred Eysn, and Peter Moser, all of Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Sept. 2, 1975, Ser. No. 609,678
Claims priority, application Austria, Sept. 12, 1974, 7408/74
Int. Cl.² C21C 5/40
U.S. Cl. 266—158 **3 Claims**

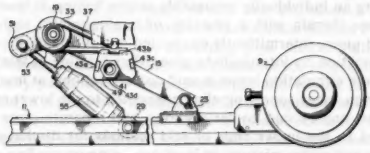


1. A converter with a converter hood, comprising
a plurality of cooling channels arranged in groups and extending over the periphery of the converter hood substantially in generatrix direction for receiving coolant to flow upwardly therethrough,
coolant passage means extending horizontally over the periphery of the converter hood and connected to the cooling channels, which coolant passage means comprises
lower coolant distributor conduit sections and
upper coolant collector conduit sections,
coolant supply and drain means connected to the coolant passage means,
coolant reflux tubes so arranged that one single reflux tube coacts with a group of cooling channels each and connects one upper coolant collector conduit section with the respective lower coolant distributor conduit section following thereupon.

3,966,181
SUSPENSION SPRING ADJUSTER

Normand Lessard, Valcourt, Canada, assignor to Bombardier Limited, Valcourt, Canada

Filed Dec. 2, 1974, Ser. No. 528,897
Claims priority, application Canada, Mar. 11, 1974, 194591
Int. Cl.² F16F 1/16
U.S. Cl. 267—58 **17 Claims**



1. In a snowmobile suspension system comprising track engaging elements to support a snowmobile upon a ground engaging portion of a snowmobile track belt, suspension arm means mounted on a frame of the snowmobile and carrying said track engaging elements and torsion spring means acting on said suspension arm means and operative to urge said track engaging elements into engagement with said track portion, said torsion spring means including a lateral arm engaging a part of said suspension system and movable to vary the force of said torsion spring means as the track engaging elements move vertically, the improvement comprising said part being in the form of a rotatably mounted cam which includes a plurality of surface portions selectively engageable with said lateral arm upon rotation of said cam, each said surface portion being effective to retain said lateral arm at a different position thereby to vary the loading in said torsion spring means.

3,966,182
LENGTHWISE-ADJUSTABLE GAS SPRING

Ludwig Stadelmann, and Fritz Bauer, both of Altdorf, Germany, assignors to Suspa Federungstechnik Fritz Bauer & Sohne oHG, Altdorf, near Nurnberg, Germany

Filed July 30, 1975, Ser. No. 600,523
Int. Cl.² F16F 9/34
U.S. Cl. 267—124 **9 Claims**

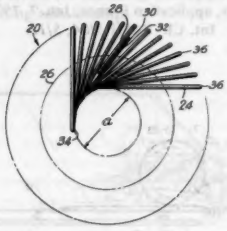
1. In a lengthwise adjustable, compressed-gas-filled spring comprising:
an outer cylinder;
an inner cylinder coaxially disposed in said outer cylinder, and defining an annular chamber therebetween;
a piston axially displaceably mounted within said inner cylinder, said piston sealingly dividing the inside of said inner cylinder into a first and a second housing chamber;
a piston rod connected at one end to said piston on the side facing said first housing chamber, said piston rod extending out of said cylinders in a sealed manner;
connecting means for providing a fluid connection between said first housing chamber and the annular chamber; and
valve means, operable from outside the cylinder, at the end of the cylinders opposite that from which the piston rod extends, for connecting or separating said second housing chamber from said annular chamber; the improvement wherein:
said inner cylinder is axially displaceable within said outer cylinder, is sealed off at the end opposite that from which said piston rod extends, and has a passageway therethrough in the vicinity of said sealed off end;
said spring further comprising sealing means in the vicinity of said passageway for sealing off said passageway in one axial position of said inner cylinder within said outer cylinder and for permitting access from said second housing chamber to said annular chamber through said passageway when said inner cylinder is in a second axial position within said outer cylinder,
whereby said inner cylinder and said sealing means serve as said valve means.

3,966,183

ARTICLE INCLUDING AN ENDLESS COIL SPRING

Salvador Escobar Mayer, Sr., Mexico City, Mexico, assignor to David Dweck, Brooklyn; Maurice Zalta, Woodmere; Camel Cohen, Brooklyn, all of, N.Y. and Robert Cohen, Deal, N.J., a part interest to each

Filed Apr. 26, 1974, Ser. No. 464,638
Int. Cl.² F16F 1/06
U.S. Cl. 267—167 9 Claims



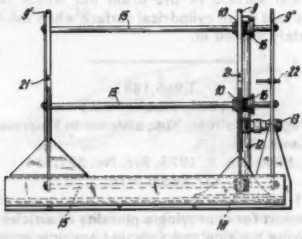
1. An article comprising an endless coil spring of substantially circular configuraton having, only as a result of the inherent resiliency of the coil spring itself, convolutions wound around a substantially circular line which extends through the hollow interior of the endless coil spring, said convolutions having inner portions which press against each other and determine the inner diameter of the endless coil spring and outer portions which are spaced from each other and determine the outer diameter of the endless coil spring, said outer portions of said convolutions being circumferentially offset with respect to the inner portions thereof, when the coil spring is not acted upon by any outside force and responds only to its inherent resiliency, so that the outer diameter of the coil spring is smaller than the outer diameter which it would have if the convolutions were arranged substantially radially with respect to the center of a circle along which said line extends at least substantially.

3,966,184

DIE-TESTING PRESS

Dino Magherini, Via Osservatorio 36, Florence, Italy

Filed June 3, 1974, Ser. No. 475,997
Int. Cl.² G01N 3/04
U.S. Cl. 269—37 3 Claims



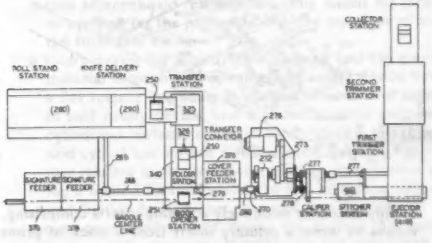
1. A horizontal die-testing press for adjusting and testing mating die halves for use in die casting, injection molding and the like of metals, metal alloys, and synthetic resin materials, said die-testing press comprising, in combination, an elongated horizontal rigid base; two substantially planar vertical opposed supports mounted on said base for horizontal movement relative to each other; said supports being constructed and arranged for anchoring thereon of respective mating die halves in opposed relation; means operable to move said supports toward and away from each other; guiding means engaged with said supports and maintaining parallelism of said supports during relative horizontal movement thereof; one of said substantially planar vertical supports being fixedly mounted on said base at one end thereof, and the other of said substantially planar vertical supports being mounted on said base for horizontal sliding movement therealong toward and away from said one support; a plurality of nuts rotatably mounted in said movable support; a respective non-rotatable and axially fixed screw threaded through each nut; means operable to rotate said nuts in synchronism with each other to effect horizontal movement of said other movable support toward and away from said one fixed support in parallel orientation thereto; said means for rotating said nuts in synchronism with each other comprising respective sprockets secured to said nuts for rotation therewith, chain means interconnecting all of said sprockets, and means for driving said chain means; said driving means comprising an electric motor; respective hand wheels secured to at least certain of said nuts for manual rotation thereof; and a third substantially planar vertical support fixed to said base at the opposite end thereof; said screws being fixed at their ends to said fixed substantially planar vertical supports, against rotation and against axial displacement; there being three screws located at different levels relative to said base and all located at the maximum distance from the longitudinal axis of said press so as to leave free the central space between the two die half mounting supports to allow an easy mounting and dismounting of the dies both from above the press and from a side thereof, and also to provide easy access for the operator into the press.

3,966,185

BOOK MAKING

William B. McCain, Hinsdale; James F. Cosgrove, Western Springs, and Edward J. Zagorski, Chicago, all of Ill., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 263,944, June 19, 1972, abandoned, which is a division of Ser. No. 32,257, April 27, 1970, Pat. No. 3,717,337. This application Feb. 11, 1974, Ser. No. 441,056
Int. Cl.² B41L 43/12
U.S. Cl. 270—37 20 Claims



1. A machine for producing signatures and forming trimmed books therefrom comprising: a roll stand having spaced spindles for supporting rolled webs of paginated printed material at least of double page width, said webs being punched along at least one edge with equidistantly spaced openings enabling the webs to be registered for proper pagination head-to-foot, a pin register belt disposed to travel beneath the spindles and having the register pins thereof spaced to register with the holes in the webs, feed means to withdraw the webs from their rolls, glue means for applying glue longitudinally between the webs approximately midway of the transverse web width, a knife at one end of the pin register belt, guide means to continuously place the webs one juxtaposed on another on the traveling pin register belt which advances the justaposed webs to the knife where the webs are severed transversely to produce juxtaposed sheets of multi page width joined by a glue joint, a folder for folding the juxtaposed sheets along the glue joint

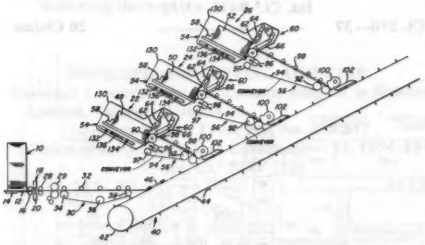
to produce a signature with a back and having the openings presented at an extended lap margin opposite the resultant back of the signature, means to transfer the juxtaposed sheets from the knife to the folder, a saddle-type conveyor adjacent the folder, means to deliver the signature from the folder to the saddle conveyor including a lap opener for divaricating the folded signature so the backbone thereof fits the saddle conveyor, and a trimmer downstream of the lap opener effective to separate the lap margins containing the register openings as waste.

17. A method for producing signatures and forming books therefrom comprising: supporting rolled webs of paginated printed material having register holes along at least one edge of each web, withdrawing web lengths from the rolls and registering the web lengths in juxtaposed relation for proper pagination head-to-foot, applying glue to one of the webs between the pages thereof and joining the webs thereby in registered form at a glue joint, advancing the joined and juxtaposed webs to a knife where the juxtaposed webs are cut transversely to the glue joint to produce juxtaposed signature sheets of at least two-page width joined by glue, folding the sheets along the glue joint to produce a signature having a glued back and a lap margin with the register holes in the lap margin, opening the signature at the lap margin and delivering the opened signature to a saddle type conveyor, delivering a second signature to the saddle conveyor and timing delivery thereof so that the two signatures are gathered together one atop another on the conveyor, trimming off the lap margins and conveying the gathered signatures to a binder where the signatures are bound at their backs.

3,966,186
METHOD AND APPARATUS FOR FEEDING INSERTS SELECTIVELY

Herbert W. Helm, Hollidaysburg, Pa., assignor to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

Continuation-in-part of Ser. No. 194,819, Nov. 2, 1971, abandoned. This application July 21, 1975, Ser. No. 597,530
Int. Cl.² B65H *39/04*
U.S. Cl. 270—58 **10 Claims**

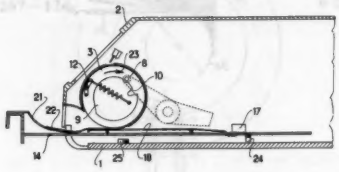


1. Apparatus for selectively collating inserts comprising,
means to move a primary insert from a stack of primary inserts at a primary insert feed station,
a reading device operable to read indicia on primary inserts,
first conveying means to convey primary inserts from said primary insert feed station across said reading device to a discharge station,
a plurality of secondary insert feed stations positioned adjacent to said first conveying means between said reading device and said discharge station,
separate means to remove a secondary insert from a source of secondary inserts at said plurality of secondary insert feed stations,
a plurality of second conveying means to separately transfer secondary inserts removed from said respective source of secondary inserts at each of said secondary insert feed stations to said first conveying means, and
signal transmitting means responsive to signals provided by said reading device to simultaneously actuate said means that remove a secondary insert from each source of secondary inserts at each of said secondary insert feed stations.

3,966,187
DEVICE FOR LOADING AND UNLOADING A SHEET ON A ROTATING DRUM

Michel Beduchaud, Palaiseau, and Andre Ramadier, Paris, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jan. 2, 1975, Ser. No. 538,216
Claims priority, application France, Jan. 7, 1974, 74.00457
Int. Cl.² B65H *5/04, 5/12*
U.S. Cl. 271—3 **7 Claims**



1. A device for loading or unloading a sheet on a drum rotatably mounted on a stand, said device comprising:
means for stopping rotation of the drum in a predetermined angular position,
a drawer,
means for slidably mounting said drawer underneath the drum for movement between two end positions, in one of which the drawer is completely pulled out relative to the drum and in the other of which the drawer is completely pushed in,
means for mechanically coupling said drawer to said drum, through a part of its sliding motion to effect rotation of said drum,
a clamping bar extending along a generatrix of the drum, and
resilient means for keeping said bar in a closed position, enabling the gripping of an edge of the sheet, and
a stop fixed to the drawer and operatively associated with the clamping bar to open it when the drawer is commpletely pulled out,
the improvement comprising the drawer being provided on a part of its upper surface with resilient pressure means, which, when the drawer is between the two end positions of its sliding movement, presses tangentially against the cylindrical surface of the drum but which no longer touches said drum cylindrical surface when the drawer is completely pushed in.

3,966,188
LABEL TRANSPORT

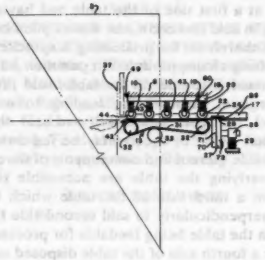
D. Bruce Maguire, Ballwin, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 2, 1975, Ser. No. 537,934
Int. Cl.² B65H *9/16, 5/26*
U.S. Cl. 271—9 **9 Claims**

1. A transport for conveying a plurality of articles between a first receiving position and a second position, comprising:
a plurality of longitudinally aligned take-away means having a first input side and a second output side, each of said take-away means including a conveying device for transporting individual ones of said articles in a first direction, the conveying devices of each of said take-away means plurality having substantially equal lengths, and a plurality of first idlers for maintaining positive control of individual ones of said articles as said articles move along said conveying device, individual ones of the conveying devices of said take-away means plurality being driven at

progressively different speeds so as to stagger alignment of said articles, said articles being received at the input side of the take-away means plurality as groups of aligned articles, the speed of the slowest take-away means being set with respect to the speed of the fastest take-away means so that the spacing between groups of articles arriving at the output sides of said take-away mean plurality is at least equal to the spacing between individual articles within each group;

guide means positioned at the output sides of said take-away means plurality, said guide means including an edge alignment portion for receiving an edge of individual articles in abutting relationship;



main conveyor means having an upper side and a lower side, said main conveyor means extending between the output sides of said take-away means plurality and said second position;

at least one main idler at the termination of each of said take-away means plurality, said main guide idler abutting said main conveyor on the lower main conveyor side, said main guide idler exerting a force on said articles which tends to drive said articles into abuttment with said edge alignment guide, said articles being inserted between said main guide idler and said conveyor on the lower side of said main conveyor;

means for driving said main conveyor means; and

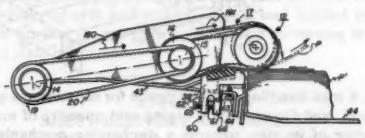
means for varying the speed of said conveying devices.

3,966,189

TOGGLING RETARD PAD

Thomas N. Taylor, Rochester, and Wayne F. Schoppe, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 5, 1974, Ser. No. 503,541
Int. Cl.² B65H *3/04*
U.S. Cl. 271—34 **15 Claims**



1. In a sheet feeding and separating apparatus for feeding and separating individual sheets from a stack of sheets including: sheet feeding and separating means comprising an endless sheet feeding and separating belt having a deformable unsupported section and retard means comprising a member having a frictional retard surface which deformably engages said feed belt in said unsupported section to form a nip for sheet advancement therebetween and a sheet queing throat, the improvement comprising:

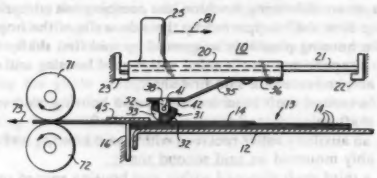
means responsive to the direction in which said sheet is moving through said nip for providing a first relatively high nip force between said retard means and said feeding means when said sheet is moving in the sheet feeding direction and for substantially reducing said nip force as compared to said first force when said sheet is moving in a second direction generally opposed to the sheet feeding direction for allowing removal of sheets from said nip, said first force comprising a desired force level for obtaining proper sheet separation.

3,966,190

SHEET ADVANCING METHODS AND APPARATUS

Frederic F. Grant, Bellflower, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 30, 1973, Ser. No. 420,737
Int. Cl.² B65H *3/02*
U.S. Cl. 271—42 **1 Claim**



1. In apparatus for advancing pieces of material, the improvement for removing the top piece of material from a stack of said pieces of material, comprising in combination:

means for resiliently mounting said stack;

means adjacent said resilient mounting means for forming an opening for the passage of only the top piece of material from said stack;

a rotary device for selectively advancing said top piece of material through said opening, said rotary device having a flat surface extending in parallel to an axis of rotation of said rotary device, and a circumferential continuous cylindrical surface, and said rotary device including at said cylindrical surface a first portion having a first friction relative to said top piece, and a second portion having a second friction relative to said top piece, said second friction being higher than said first friction;

means connected to said device for moving said second portion into engagement with said top piece and for moving said top piece with said engaged second portion relative to the remaining pieces in said stack and through said passage opening, and for alternatively moving said first portion into contact with said top piece and said second portion out of engagement with said top piece and for moving said rotary device along a top piece of said stack in a direction contrary to the direction of movement of said top piece with said engaged second portion; and

means adjacent said flat surface of said rotary device for stopping with the aid of a first part of said rotary device at said flat portion the rotation of said rotary device when said second portion has been moved into engagement with said top piece, and for stopping with the aid of a second part of said rotary device at said flat portion the rotation of said rotary device when said first portion has been moved into contact with said top piece.

3,966,191

SHEET SEPARATING DEVICE

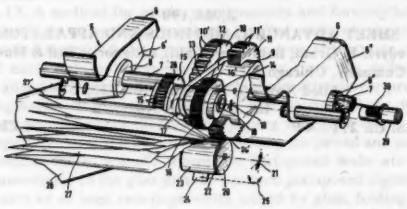
Harry Strobel, Berlin, Germany, assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 16, 1975, Ser. No. 568,589

Claims priority, application Germany, Apr. 25, 1974, 2420078

Int. Cl.² B65H 3/06

U.S. Cl. 271—125 8 Claims



2. A sheet separator device for feeding sheets individually from a stack of sheets, located within a hopper having side walls, to an addressing machine, the combination comprising:

A. a first shaft supported by the side walls of the hopper;

B. a housing pivotably supported by said first shaft;

C. a separator roller located within said housing and rotatably mounted on said first shaft;

D. a second shaft received within said housing, said second shaft being spaced from said first shaft;

E. an auxiliary roller received within said housing and rotatably mounted on said second shaft;

F. a third shaft disposed within said housing spaced relative to said first shaft;

G. a friction wheel rotatably mounted on said third shaft in operational engagement with said separator roller; and

H. a tension biasing member associated with one of the side walls of the hopper and having one end engaging said housing, said spring being positioned to exert a tension upon said housing.

3,966,192

SHEET PILE ELEVATOR IN SHEET DELIVERY SYSTEMS FOR PRINTING MACHINES

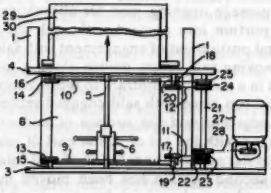
Willi Jeschke, Heidelberg, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Continuation of Ser. No. 421,769, Dec. 3, 1973, abandoned, which is a continuation of Ser. No. 231,437, March 2, 1972, abandoned, which is a continuation of Ser. No. 29,040, April 16, 1970, abandoned. This application Sept. 27, 1974, Ser. No. 509,945

Claims priority, application Germany, May 3, 1969, 1922694

Int. Cl.² B65H 1/14

U.S. Cl. 271—147 2 Claims



1. Sheet pile elevator in a sheet delivery system of a printing machine having a substantially rectangular sheet pile table located within a framework of the sheet delivery system, comprising a plurality of shaft stubs, each of said stubs being mounted on the framework above each of the corners of the sheet pile table, said stubs having a length that is short compared to the width of the table and carrying a respective rotary guide roller, said shaft stubs having symmetry axes and said guide rollers having rotary axes extending in a direction wherein sheets piled on the table are feedable therefrom for processing, a plurality of lifting roller chains articulatingly secured at one end thereof to each of the corners of the table and extending upwardly and over said guide rollers, respectively, the roller chain joints of said roller chains having rotary axes extending parallel to the direction in which the sheets are being fed, so that the table is laterally adjustable, a single drive shaft for rotating all of said guide rollers simultaneously so as to drive all of said lifting chains simultaneously, said shaft being located at a first side of the table and having a rotary axis extending in said direction, the sheets piled on the table being feedable therefrom for processing, a sprocket wheel for each of said lifting chains mounted in common on said single drive shaft at said first side of the table, said lifting chains having a free end, respectively, leading to a respective sprocket wheel, the table framework and said chains being arranged so that a pile of sheets may be fed onto the table from a second side thereof and components of the sheet delivery system overlying the table are accessible to servicing personnel from a third side of the table which is disposed substantially perpendicularly to said second side thereof, the sheets piled on the table being feedable for processing in said direction over a fourth side of the table disposed substantially at right angles to said first side of the table, whereby the sheets being fed are easily inspectable and the view and serviceability of the sheet delivery system remains unobstructed.

3,966,193

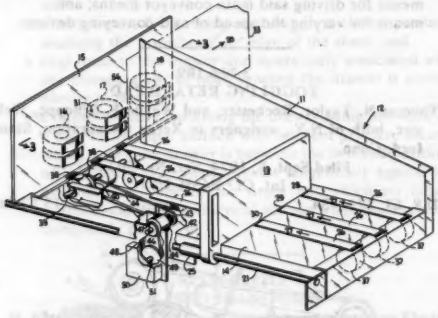
MAIL HANDLING STACKING AND FEEDING APPARATUS

Anthony Storace, Tarrytown, N.Y., and Paul R. Sette, Hamden, Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Mar. 12, 1975, Ser. No. 557,490

Int. Cl.² B65H 1/02, 1/24

U.S. Cl. 271—150 8 Claims



1. A mail-handling stacking device for supporting a quantity of mail, and for uniformly urging said quantity of mail irrespective of its size, towards a discharging mechanism in a fluctuating manner, comprising:

support means for supporting a quantity of mail;

pressure means carried by said support means for urging said quantity of mail towards a discharging mechanism;

drive means operatively connected to said pressure means for driving said pressure means into operative engagement with a quantity of mail supported by said support means;

clutch means comprising a dual clutch mechanism, a first clutch of which is operatively connected to said drive means for causing said drive means to be coupled and decoupled from driving said pressure means, and a sec-

ond clutch of which is a slip clutch operatively connected to said drive means for causing said drive means to drive said pressure plate with a constant force when said first clutch is not decoupling said drive means; and

sensing means disposed adjacent said discharging mechanism for sensing the discharging of pieces of mail, said sensing means being operative to descouple said pressure means from said drive means via said first clutch in response to sensing a discharging piece of mail, and to couple said pressure means to said drive means via said first clutch when no discharging piece of mail is sensed such that said pressure means will be caused to fluctuate between a mail urging and a mail non-urging condition.

3,966,194

APPARATUS FOR MANIPULATING FINISHED REPRODUCTIONS IN COPYING MACHINES

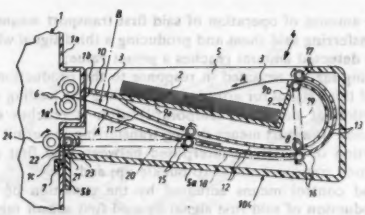
Günter Abbé, Gilching; Rüdolf Eppe, Taufkirchen; Rudiger Ettelbrück, Munich; Josef Pfeifer, Unterhaching, and Günther Schnall, Eching, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

No Drawing. Filed Mar. 26, 1975, Ser. No. 562,243

Claims priority, application Germany, Mar. 28, 1974, 7410968[U]

Int. Cl.² B65H *29/40*

U.S. Cl. 271—186 **6 Claims**



1. Apparatus for manipulating sheet-like finished reproductions in a copying machine wherein at least one side of each reproduction is provided with information, comprising means for advancing successive finished reproductions into an elongated path having successive first, second and third portions in the first of which said one side of each reproduction faces substantially upwardly so that said one side is observable from above for determination of the presence, absence and/or quality of information; means for inverting successive finished reproductions in said second portion of said path so that said one side of each reproduction faces downwardly; means for stacking successive inverted reproductions on top of each other in said third portion of said path; and an observation window integral with said stacking means and located above said first portion of said path between said advancing means and said stacking means.

3,966,195

SHEET DELIVERY MECHANISM

Claus Simeth, Offenbach, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

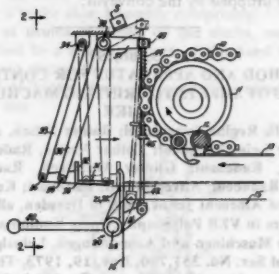
Filed Jan. 14, 1974, Ser. No. 433,130

Claims priority, application Germany, Jan. 15, 1973, 2301840

Int. Cl.² B65H *31/18*

U.S. Cl. 271—189 **13 Claims**

1. In a sheet delivery mechanism of a sheet fed printing press, the combination comprising means for supporting a pile of sheets, an endless conveyor terminating above the pile and having a set of grippers for carrying an individual sheet and for releasing it above the pile for depositing thereon, vertical guide members alined with the front edge of the pile for stopping the forward motion of a sheet deposited on the pile, a horizontal supporting finger above the pile and in the vicinity of the forward edge thereof, means for mounting the supporting finger for horizontal receiprocating movement between a retracted position in which the supporting finger is clear of the pile and an interposed position in which the supporting finger is above the pile to provide temporary support for a sheet



deposited by the grippers, and manually operated means coupled to the finger mounting means and to the front guide members for (a) moving the supporting fingers into a position above the pile to intercept a fallen sheet and thereafter retracting the guide members to permit withdrawl of the top sheet on the pile for inspection and control purposes and (b) restoring the guide members to vertical working position and thereafter withdrawing the supporting finger.

3,966,196

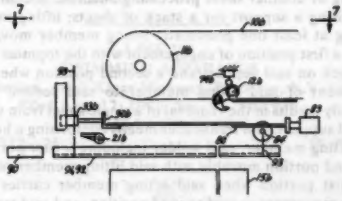
SHEET DELIVERY MECHANISM

Claus Simeth, Offenbach, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Division of Ser. No. 433,130, Jan. 14, 1974, abandoned. This application May 7, 1975, Ser. No. 575,480

Int. Cl.² B65H *31/32, 29/68*

U.S. Cl. 271—218 **1 Claim**



1. In a sheet delivery mechanism of a sheet fed printing press, the combination comprising means for supporting a pile of sheets, an endless conveyor terminating above the pile and having a set of grippers for carrying an individual sheet and for releasing it above the pile for depositing thereon, vertical guide members alined with the front edge of the pile for stopping the forward motion of the sheet deposited on the pile, a first set of horizontal supporting fingers above the pile and in the vicinity of the forward edge thereof, a second set of horizontal supporting fingers above the pile and in the vicinity of the rear edge thereof, means for mounting the sets of fingers for movement between a retracted position in which the fingers are clear of the pile and an interposed position in which the supporting fingers are above the pile to provide temporary support of a sheet deposited by the grippers, manually operated means for actuating the mounting means for the fingers so that the sheet and any subsequently deposited sheets are totally supported by the fingers thereby permitting removal of

the pile for formation of a new pile when the supporting fingers are subsequently retracted, means including suction ports on the fingers for holding the sheet and subsequently fed sheets positively thereon until the fingers are retracted to begin formation of a new pile, a pair of platform rails suspended above the pile and below the fingers and in which a platform is provided slidable onto the rails for starting the new pile, and suction discs interspersed between the second set of fingers for decelerating the forward component of movement of a sheet dropped by the conveyor.

3,966,197

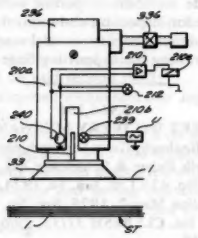
METHOD AND APPARATUS FOR CONTROLLED FEEDING OF SHEETS TO PRINTING MACHINES OR THE LIKE

Rudi Riedl; Regina Jungnickel; Rainer Nitsch, all of Leipzig; Werner Lein, Radebeul; Lothar Vetter, Radebeul; Helmut Schone, Radebeul; Günter Weisbach, Radebeul; Hans Johne, Radebeul; Alfred Schott, Radebuel; Karl-Heinz Forster, and Albrecht Johne, both of Dresden, all of Germany, assignors to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, Germany

Division of Ser. No. 357,790, Nov. 19, 1973. This application Mar. 13, 1975, Ser. No. 558,117

Int. Cl.² B65H 7/14

U.S. Cl. 271—260 **1 Claim**



1. In an apparatus for feeding sheets from a stack into a printing or another sheet processing machine, a combination comprising a support for a stack of sheets; lifting means including at least one pneumatic lifting member movable between a first position of engagement with the topmost sheet of the stack on said support and a second position whereby the movement of said lifting member to said second position normally results in the removal of a single sheet from the stack on said support; and transducer means comprising a holder for said lifting member, said holder including a first portion and a second portion movable with said lifting member relative to said first portion when said lifting member carries a sheet during movement to said second position, and said transducer means further comprising a contact-free initiator having a first part provided on said first portion and a second part provided on said second portion and cooperating with said first part to produce a signal when said second portion fails to move relative to said first portion whereby such signal indicates that said lifting member does not carry a sheet in said second position thereof.

3,966,198

SHEET CONVEYING DEVICE

Kenya Komada, Atsugi, and Yoshiaki Kondo, Kawasaki, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1974, Ser. No. 534,150

Claims priority, application Japan, Dec. 27, 1973, 49-2081

Int. Cl.² B65H 5/06, 29/20

U.S. Cl. 271—265 **6 Claims**

1. A sheet conveying device comprising:

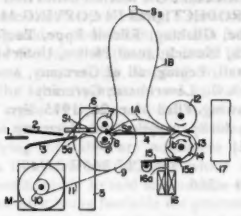
first transport means for transferring a flexible sheet at a first transfer rate;

second transport means, arranged on the downstream side of said first transport means in a position spaced therefrom a distance smaller than the length of said sheet, for transferring the sheet from said first transport means at a second transfer rate higher than said first transfer rate;

first sensor means for sensing the presence of said sheet and producing a first signal in response thereto;

second sensor means, disposed downstream of said first sensor means and upstream of said second transport means, for sensing the presence of said sheet and producing a second signal in response thereto;

first control means actuated in response to the simultaneous production of said first and second signals for detecting



the amount of operation of said first transport means in transferring said sheet and producing a third signal when the detected amount reaches a preset value;

catching means actuated in response to the production of said third signal for gripping and holding the leading end portion of the sheet temporarily after it reaches said second transport means during transferring to permit the portion of the sheet interposed between said first and second transport means to buckle-up; and

second control means actuated by the cessation of the production of said first signal by said first sensor means following the simultaneous production of said first and second signals for initiating the transfer of the sheet by said second transport means following the gripping and holding of the leading end portion of the sheet by said catching means.

3,966,199

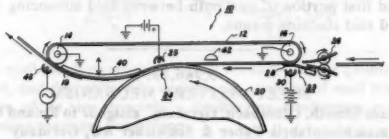
BELT TRANSFER LOADING SYSTEM

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 17, 1975, Ser. No. 558,750

Int. Cl.² B65H 5/02

U.S. Cl. 271—275 **5 Claims**



1. In an electrostatographic copying system in which an image is transferred at a transfer station from an imaging surface to a copy sheet, and wherein said copy sheet is passed through said transfer station on a moving copy sheet transport belt to which said copy sheet is electrostatically tacked prior to said passage through said transfer station, the improvement comprising:

electrical corona charge generating means spaced adjacent to said transport belt, at a copy sheet loading position on said transport belt spaced from said imaging surface, for

electrostatically tacking said copy sheet to said belt with corona generated charges, and

a plurality of elonated sheet guide fingers extending towards said transport belt and extending between said corona charge generating means and said transport belt at said copy sheet loading position for urging said copy sheet into engagement with said transport belt while said copy sheet is simultaneously subjected to corona charges from said corona charge generating means,

said sheet guide fingers being substantially spaced apart with openings therebetween for said corona generated charges to pass therethrough,

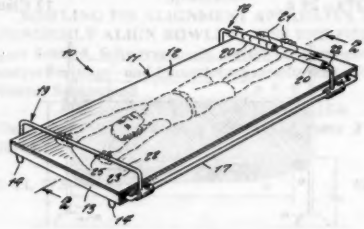
and said sheet guide fingers extending at an angle to the direction of movement of said transfer belt at said copy sheet loading position to provide for uniform charging of said copy sheet by said corona generated charges, wherein terminal portions of said guide fingers are flexibly pressed into sliding engagement with said transport belt to resiliently press said copy sheet against said belt.

3,966,200

STRETCHING EXERCISING DEVICE

Norman Kirk, 9 Rosedale Ave., Montclair, N.J. 07042

Filed May 12, 1975, Ser. No. 576,583
Int. Cl.² A63B 21/10
U.S. Cl. 272—109 **1 Claim**



1. An exercising apparatus, comprising in combination, a low table, a rail along opposite two side edges of said table, and a pair of inverted, U-shaped bars bridging said table being slidably, adjustably supported at their ends upon said rails; said table comprising a rectangular flat panel mounted upon a frame supported upon short corner legs, each said rail comprising a U-shaped metal pipe secured at each end of said table frame, a central portion of said pipe extending parallel and spaced from said table side edge, each said U-shaped bar comprising a metal pipe having a straight central portion that is parallel and spaced above said table panel, opposite ends of said U-shaped bars being downwardly bent and affixed in metal sleeves slidable on said rails, and winged set screw means for locking said bars in a fixed position along said rails, and a pair of cushioned rollers of soft rubber being slidably fitted on one said bar for cushioning a person's feet bearing thereagainst, and a cylindrical surface of each said roller being spiralled for feet stimulation when rolled thereagainst.

3,966,201

EXERCISING MACHINE

Joseph H. Mester, 373 S. Seguin Ave., New Braunfels, Tex. 78130

Continuation of Ser. No. 453,529, March 21, 1974, abandoned. This application June 10, 1975, Ser. No. 585,566
Int. Cl.² A63B 21/22, 23/04
U.S. Cl. 272—72 **8 Claims**

8. An exercising machine, comprising, in combination:

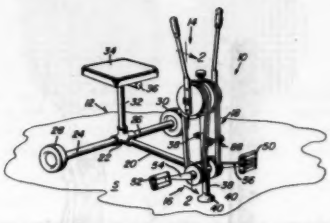
a. a frame;

b. hand means including a pair of levers independently pivotally mounted on the frame for selective actuation by an exerciser's hands; and

c. brake means for applying a drag independently and equally to each of the levers, the hand means further including a pair of shafts mounted on the frame, and the pair of hand levers pivotally mounted on the shafts, whereby each of the hand levers is movable independently of the other of the hand levers, the brake means including a brake shoe assembly comprising;

i. a pair of drums mounted on the shafts, each drum connected to a respective one of the hand levers to form a set therewith;

ii. a pair of brake shoes arranged for contacting the drums; and



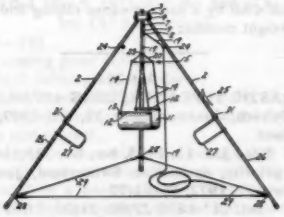
iii. a support means for adjustably mounting the brake shoes on the frame and permitting varying of the bias of the brake shoes against the drums, the support means including a member, a rod pivotally connected to the member at a point thereon between the brake shoes, a coiled spring having coils arranged about the rod and an end coil thereof abutting the frame, a washer arranged on the rod engaging an end coil of a spring spaced form the end coil abutting the frame, screw threads provided on the rod, and a nut threadingly engaged with the screw threads of the rod and contacting the washer for positioning the washer as a function of a desired deflection of the spring, the spring deflecting being a function of the bias of the brake shoes on the drums.

3,966,202

SWIMMING APPARATUS

Sam Cynamon, 4011 Kings Highway, Brooklyn, N.Y. 11234

Filed Aug. 12, 1975, Ser. No. 603,936
Int. Cl.² A63B 31/00
U.S. Cl. 272—71 **10 Claims**



1. An apparatus used in the instruction and learning of swimming movements and capable of being used both on land and in the water, comprising a stationary tripod support means containing upwardly converging leg members, interconnecting means at their upper ends to limit the divergent movement of said leg members and having a suspension support means; a freely-swinging horizontally balanced torso support means

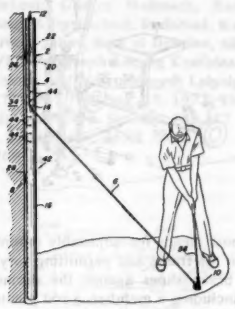
adjustably suspended from said suspension means comprising an open ended flexible sling for receiving the user in a prone position, and a sling support balancing means connected to said sling by means of flexible cable and at a sufficient height from said sling to permit unimpeded freedom of swimming motion.

3,966,203

RESISTANCE TYPE GOLF SWING PRACTICE AND EXERCISE DEVICE

Richard A. Bickford, No. 2 Pocahontas Drive, Dade City, Fla. 33525

Filed Mar. 10, 1975, Ser. No. 557,184
Int. Cl.² A63B *21/00*
U.S. Cl. 272—118 **7 Claims**



1. A golf swing practice and exercise device for use in training and building the muscles of the body employed in swinging of a golf club which comprises:
   - a free-fall weight member,
   - a tube adapted to receive said weight member and to maintain it during movement thereof in a straight path,
   - mounting means to hold said tube in a substantially vertical position,
   - a golf club,
   - a cord fixed at its proximal end to means attaching it to the head of said golf club,
   - means on said weight member by which the distal end of said cord is fastened thereto,
   - a first fairlead for said cord fixed to said guide member adjacent the top thereof,
   - a second fairlead for said cord and,
   - means to hold said second fairlead at different positions between the ends of said tube during a practice swing of the golf club by a user to cause raising and lowering of said weight member.

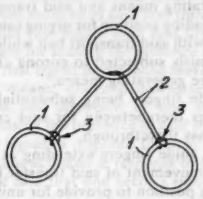
3,966,204

ELASTIC TYPE EXERCISING APPARATUS

Werner Dubach, Illnauerstrasse 32, CH-8307, Effretikon, Switzerland

Filed Jan. 12, 1973, Ser. No. 323,154
Claims priority, application Switzerland, Jan. 13, 1972, 467/72; Nov. 17, 1972, 16761/72
Int. Cl.² A63B *23/00*, *21/00*, *23/04*
U.S. Cl. 272—135 **6 Claims**

1. Fitness apparatus for the performance of gymnastic exercises based on stress and relaxation, said apparatus comprising:
   - a. a plurality of tough elastic ring-shaped hand grips,
   - b. connector means including at least one endless elastic tensile element connected to two of the ring-shaped hand grips by being passed through each said two hand grips and formed into a knot,
   - c. said two hand grips being engaged one within the other with their planes approximately at right angles with respect to each other and connected at one of their points



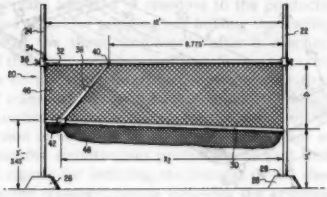
of contact by said tensile element knotted about said rings, and
   - d. a spherical weight disposed within both said two hand grips.

3,966,205

TENNIS SERVE PRACTICE DEVICE AND METHOD OF USING SAME

David B. Schain, 11124 Arroyo Drive, Rockville, Md. 20852, and Morton R. Kagan, 2 Charen Court, Potomac, Md. 20854

Filed Feb. 20, 1975, Ser. No. 551,419
Int. Cl.² A63B *69/38*
U.S. Cl. 273—29 A **12 Claims**



8. A method for enabling a tennis player to accurately practice his service without actually using regulation tennis court facilities, said method comprising the steps of:
   - providing a upright framework means having adjustably interconnected members which define a trapezium-shaped quadrilateral opening;
   - positioning one of said members to define a top member, another of said members to define a bottom member, another of said members to define a straight side member and another of said members to define an angular side member which forms an obtuse angle with said top member and an acute angle with said bottom member;
   - measuring the effective sevice height of the tennis player,
   - adjusting the position of said top member relative to said bottom member in calculated accordance with said measured effective service height;
   - adjusting the angular disposition of said angular side member with respect to said top and bottom members in calculated accordance with said measured effective service height; and
   - positioning the framework means with the adjusted members at a predetermined distance away from the tennis player, to permit the tennis player to direct his service at the said opening.

11. A tennis serve practice device comprising:
   - adjustable upright frame means including first, second, third, and fourth frame members adjustably interconnected and thereby forming and circumscribing a trapezium-shaped quadrilateral opening of variable configuration;

net means connected to said frame members and disposed adjacent to said opening;

said net means having a surface area greater than that of said opening to form a tennis ball receiving and retaining pocket;

said first frame member being disposed substantially perpendicular to the ground;

said second frame member being disposed substantially perpendicular to said first frame member;

said third frame member being disposed beneath said second frame member and extending from said first frame member to the lower end of said fourth frame member;

said fourth frame member being variable in length and being pivotally attached at its upper end to said second frame member and adjustably attached at its lower end to said third frame member;

said fourth frame member thus being relatively movable along said third frame member for attachment at a predetermined position therealong;

said fourth frame member forming an acute angle with said third frame member and an obtuse angle with said second frame member;

said adjustment of said frame means being in calculated accordance with the serving height of the person using said device to vary the configuration of said opening to assure that the pocket will receive and retain only those served tennis balls which would land in the proper service area of a regulation tennis court.

3,966,206

BOWLING PIN ALIGNMENT APPARATUS TO UNIFORMLY ALIGN BOWLING PINS END-FOR-END

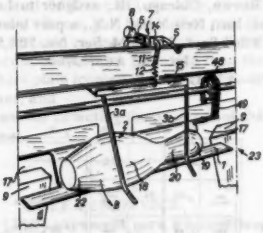
August Schmid, Schwerzenbach, Switzerland, assignor to Patentverwertungs - und Finanzierungsgesellschaft, SERANIA, Glarus, Switzerland

Filed June 23, 1975, Ser. No. 589,182

Claims priority, application Switzerland, June 27, 1974, 8828/74

Int. Cl.² A63D *5/08*

U.S. Cl. 273—43 E **10 Claims**



1. Bowling pin alignment apparatus to uniformly orient and align bowling pins end-for-end upon being applied to the apparatus in randomly oriented position comprising

means (1) temporarily supporting a bowling pin (2) in essentially horizontal position; means for moving the bowling pin;

two sensing and holding levers (3*a*, 3*b*) located in horizontally spaced position and engageable with the bowling pin body portion (18) and the neck portion (19, 20) respectively upon movement of the pin; and

interlock means (7, 8, 21; 41, 42) operatively connected to both said levers and locking that one of the levers (FIG. 1: 3*b*) engaging the neck poriton (19, 20) of the pin (2) therebeneath, while releasing movement of the lever (3*a*) which engages the body portion (18) therebeneath,

whereby, upon disengagement between said support means (1) and the pin (2), the pin will fall due to the greater weight of the body portion with the body portion first, downwardly, while being restrained by that one of the levers engaging the neck portion to thereby align and orient the pin with the body portion in downward direction.

3,966,207

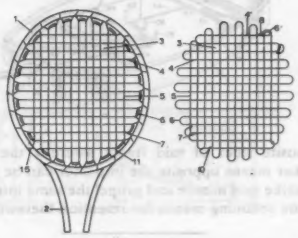
STRING SYSTEM FOR A GAME RACKET

Roger D. Pass, 1119 W. Montana Ave., St. Paul, Minn. 55108

Filed June 25, 1973, Ser. No. 372,907

Int. Cl.² A63B *51/02*

U.S. Cl. 273—73 D **1 Claim**



1. A game racket and string system therefor comprising a racket frame having an unstrung open head portion, a handle portion and an intermediate throat portion, said head portion having string support means spaced about the inner periphery of said head portion for receiving said string system, said string system having substantially parallel runs of interwoven strings at right angles to each other, adjacent pairs of similarly oriented strings forming loops around the outer periphery of said string system with four terminal loops each formed by one run of string secured to itself, each of said loops and terminal loops respectively corresponding in spacing to the spacing of said string support means, the planar dimensions of the outer periphery of said string system in its normal, unstrung non-tensioned condition being less by a predetermined amount than the planar dimension defined by the interior periphery of said string support means, whereby the respective loops of said string system are adapted to be directly stretched onto their respective string support means and result in a strung racket of a desired tension as determined by said predetermined lesser dimension of said string system.

3,966,208

TETHERED BALL GOAL SCORING GAME

Robert Edward Gohsler, 10662 Gabacho Drive, San Diego, Calif. 92124

Filed June 5, 1975, Ser. No. 584,173

Int. Cl.² A63B *65/12*

U.S. Cl. 273—101 **11 Claims**

1. A goal scoring game comprising:

a game board defining a playing area,

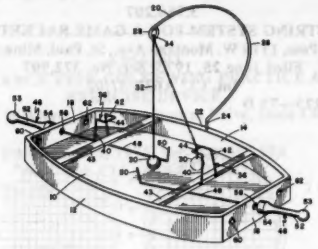
a tethered impact receiving missile normally disposed in a suspended quiescent position and adapted for swinging over the game board,

support means for suspending said missile over said game board, said support means bowed outwardly of same game board in a nonobstructing relationship with the tether of a missile propelled to above said support means,

retaining means intermediate a side of the game board and the quiescent position of said missile, and projecting toward the missile quiescent position defining a goal scoring zone reachable only by propelling said missile to adjacent said retaining means and then behind the same for retention within the goal scoring zone,

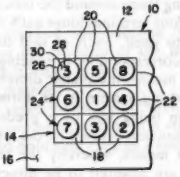
and striker means slidably associated with said game board and disposed below said retaining means, said striker means adapted for striking said missile and propelling the

same in a generally pendulum motion toward the goal defining said playing area, said striker means includes an elongated shank with an impactor connected to the shank, said striker means slidably received in holes in



opposite sides of said frame whereby the end of the striker means opposite the impactor can be manipulated to strike said missile and propel the same into the vicinity of the retaining means for retention therewith.

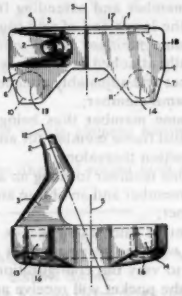
3,966,209
NUMBERS GAME
Anne Gambardella, Brooklyn, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Apr. 10, 1975, Ser. No. 566,910
Int. Cl.² A63F *3/00*
U.S. Cl. 273—130 R **1 Claim**



1. A number problem game, which comprises:
a. a playing board having a top planar surface thereon;
b. seven boxes contained on said top surface, each said box formed from nine squares, said nine squares arranged in three horizontal and three vertical rows intersecting each other; and
c. a plurality of sets of playing discs with each disc having numbered indicia thereon, the indicia on each disc within a set being identical with the indicia on all other discs in that set, the indicia for each set differing from the indicia of every other set, the indicia of the respective sets including the respective numbers one to eight, each set comprising at least ten discs, said discs positionable in said squares of said seven boxes for forming fifty six multiple digit numbers of a three digit character in said seven boxes.

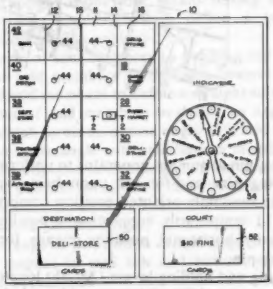
3,966,210
GOLF CLUB
John J. Rozmus, 1030 Derwydd Lane, Berwyn, Pa. 19312
Filed Feb. 11, 1969, Ser. No. 798,351
Int. Cl.² A63B *53/04*
U.S. Cl. 273—169 **2 Claims**

2. In a golf club:
a head with heel and toe sections and front and rear sides;
a ball striking face formed on the front side with the plane of impact of the head being located between the heel and toe sections and being generally normal to the striking face;
a shaft connected to the head with the projection of the shaft axis extending through the plane of impact;
means on the head forming weight means respectively disposed on opposite sides of the plane of impact and whose mass concentrations are located substantially outwardly from the plane of impact respectively toward the heel and toe sections and also substantially spaced from the pro-



jection of the shaft axis in a rearward direction, said disposition of the shaft axis and the location of the mass concentrations being for use in causing the striking face, during the swing to be oriented generally normal to the line of swing and for use in providing for the head to have, at the moment of ball impact, a high moment of inertia with respect to the plane of impact so as to minimize twist of the striking face; and
said mass concentrations being substantially formed by a pair of weights in said head.

3,966,211
TRAFFIC COURT BOARD GAME
Eugene B. Brown, Chicago, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Sept. 23, 1974, Ser. No. 508,503
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 GM **4 Claims**



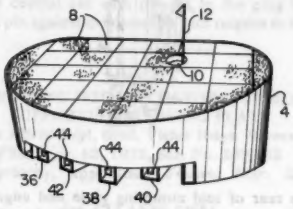
1. A board game apparatus having a plurality of line indicia defining an elongated street and a plurality of blocks disposed along at least one side of said street, each block having an indicia thereon designating a different one of a plurality of commercial institutions, a plurality of first cards having instructions designating different ones of said commercial institutions for determining goal board destinations, a means for random selection of one of said plurality of commercial institution indicia or one of a plurality of traffic offenses commit-

ted on said street, a plurality of second cards having indicia indicating different monetary fines, a supply of play money for players, and a plurality of playing elements each of which represents a single player for movement to said blocks having commerical institution indicia selected by said random selection means.

3,966,212
SIMULATED GOLF GREEN

Richard Mason, 637-39 E. Olney Road, Norfolk, Va. 23510

Filed Nov. 14, 1975, Ser. No. 632,070
Int. Cl.² A63B *69/36*
U.S. Cl. 273—181 A **5 Claims**



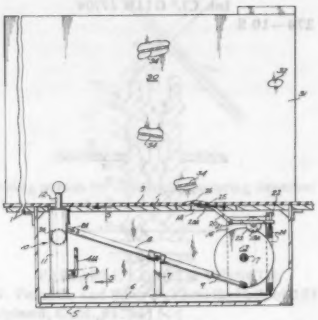
1. A simulated golf green comprising:
a. a base means comprising a base plate, a plurality of divider means mounted on said base plate, said divider means defining a plurality of areas on said base plate, a plurality of holes through said base plate, one of said holes being located in each of said areas, and a plurality of channel means mounted on said base plate, each of said channel means being positioned below one of said holes;
b. a plurality of surface plates positioned over said base means, said surface plates forming a substantially contiguous cover thereover;
c. a plurality of support means mounted on said base plate, each support means supporting one of said surface plates such that said surface plates can tilt with respect to said support means at 360° around the axis of said support means, wherein when a golf ball strikes one of said surface plates it tilts said surface plate falling therefrom into one of said areas of said base plate and then through the hole in said base plate located in said area into one of said channel means; and
d. detector means for detecting the presence of the golf ball in said channel.

3,966,213
GOLF TEE DEVICE

John G. Bradley, 1800 Lakewood Court, Eugene, Oreg. 97402

Filed Apr. 3, 1975, Ser. No. 564,686
Int. Cl.² A63B *57/00*, *69/36*
U.S. Cl. 273—201 **3 Claims**

1. A golf ball teeing device comprising,
a platform on which the golfer stands,
a base disposed below said platform,
arm means rockably mounted on said base,
a tee assembly supported by said base and coupled to one end of said arm means and thereby actuated in a reciprocating manner during rocking motion of the arm to position a golf ball above the platform,
arm actuating means for cyclic oscillation of the arm means, said arm actuating means including a circular cam plate having a recessed area defined by its outer periphery, a switch arm including follower means in riding contact with the cam plate, a switch carried by said switch arm in circuit with a motor driving said cam plate and with an electrical source, said switch arm disposed subjacent said platform and including an arm segment disposed within a platform opening permitting actuation of the switch arm by the golfer to close the arm carried switch to initiate motor operation, said arm carried switch opened to stop motor operation upon said follower means engaging the cam plate defined recess, and

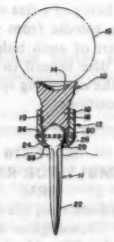


ball guide means communicating a gravitating supply of golf balls to said tee assembly and including a ball release mechanism actuated by said rockably mounted arm means during each cycle of operation to sequentially release golf balls to the tee assembly.

3,966,214
TILT TOP GOLF TEE

Dalford D. Collins, 2016 Walnut St., Hastings, Minn. 55033

Filed May 27, 1975, Ser. No. 580,878
Int. Cl.² A63B *57/00*
U.S. Cl. 273—207 **10 Claims**



1. A golf tee comprising:
a shank element for insertion into the golfing surface; and
a head element including a ball supporting portion and a shank retaining portion threadedly connected with each other, said shank retaining portion having means for retaining said shank element for limited pivotal movement relative thereto and said ball supporting portion and said shank retaining portion being theadedly connected such that tightening of such threaded connection restricts the freedom of relative pivotal movement between said shank element and said shank retaining portion.

3,966,215

PHONOGRAPH AUTO-CHANGER CENTER SPINDLE

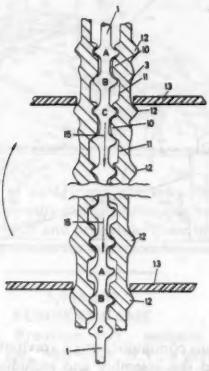
Keith Douglas Ridler, Fulbourn, and Alexander Bennett Gosling, Linton, both of England, assignors to Strathearm Audio Limited, Belfast, Ireland

Filed Jan. 29, 1975, Ser. No. 545,164

Claims priority, application United Kingdom, Feb. 1, 1974, 4812/74

Int. Cl.² G11B 17/04

U.S. Cl. 274—10 S 7 Claims



1. A phonograph auto-changer centre spindle including a one-piece tubular sleeve of resilient material having an operating length over which it is continuous, an operating spindle within the sleeve, means to move the resilient sleeve and the operating spindle relative to one another longitudinally to first and second respective positions, the resilient sleeve having an operating length which is at least equal to the thickness of a plurality of records to be played, said sleeve co-operating with the operating spindle over its operating length and having variations in the cross-sectional area of its wall along its operating length and the operating spindle having a plurality of variations in its surface which co-operate with the variations in the resilient sleeve to produce a plurality of bulges in the external surface of the sleeve in the first of the said respective positions, each bulge being of a size sufficient to prevent a disc record on the centre spindle from passing along the centre spindle, at least a part of each bulge being reduced in size sufficient to allow a disc record to pass over the said parts when the sleeve and the operating spindle are in the second of the said respective positions.

3,966,216

CARTRIDGE ASSEMBLY FOR RECORD PLAYER TONE ARM

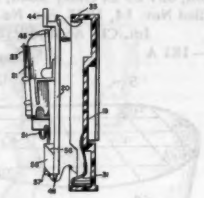
Secundino Rodriquez Sandoval, Mexico City, Mexico, assignor to Investigaciones Tecnologicas Electromecanicas y Electronicas, S.A., Mexico City, Mexico

Filed May 7, 1975, Ser. No. 575,219

Int. Cl.² G11B 3/02

U.S. Cl. 274—25 1 Claim

1. A cartridge assembly for a record player tone arm comprising a generally box-shaped base having a top an open bottom front and rear ends and a pair of side walls, each of the side walls being provided with an angled slot extending toward the rear end, said rear end being provided with a plurality of recesses said recesses opening towards the bottom of said base, a first set of electrical contacts mounted on the base adjacent the rear end, each of the contacts of the first set being formed of a generally U-shaped piece of flexible and resilient spring metal, each of the contacts of the first set having one end thereof inserted into one of the recesses, a cartridge-mounting plate positioned between the side walls of the base and having a pair of laterally outwardly extending locking wings positioned within the slots in the side walls of the base and a front end positioned adjacent to and rearwardly of the front end of the base, detent means on the front end of the base engaging the front end of the mounting plate for releasably holding the mounting plate between the side walls, a second set of electrical contacts mounted on and extending



from the rear of said mounting plate and engaging the U-shaped contacts of the first set and flexing the U-shaped contacts rearwardly, the locking wings and the slots in the side walls of the base having engaging camming surfaces for preventing withdrawal of the locking wings from the slots when the detent means on the base engages the front end of the mounting plate, a cartridge holder secured to the mounting plate, and wires connecting the contacts of the second set to the cartridge holder.

3,966,217

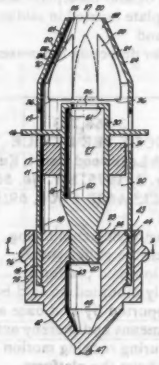
AUTOMATIC CHUCK

Harold Tummel, St. James, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 22, 1975, Ser. No. 570,417

Int. Cl.² B23B 31/19

U.S. Cl. 279—59 1 Claim



1. A chuck fitted with jaws for holding a tool in detachable engagement with a shaft to which the chuck may be concentrically fastened; comprising

a housing having a front tapered section and a rear open section,

a plurality of jaws mounted inside the front section of the hollow tapered housing,

a central pin located in the interior of the housing so as to bear, when moved towards the jaws, against the rear ends of the jaws, such bearing causing the sides of the jaws to slide against the taper to move the jaws together,

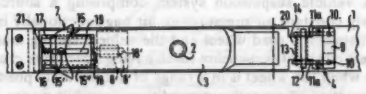
a plug threadably engaged to the rear end of the housing,

a pin transversely mounted to the central pin, said pin extending through a slot in the housing wall, in which the rear of the central pin is formed of an oval-shape cross-section and the plug is formed with a recess of oval-shaped and larger cross-section than the cross-section of the oval portion of the central pin, with the exterior of the oval section of the central pin formed as a male screw thread, and the interior surface of the oval-shaped recess of the plug formed as a female screw thread so that turning the central pin with respect to the plug locks said central pin against axial motion with respect to the plug.

3,966,218
SKI BINDING WITH INCORPORATED BOOT SUPPORTING PIVOTING PLATE

Jean Joseph Alfred Beyl, Blvd. Victor Hugo, Nevers, France

Filed Mar. 18, 1975, Ser. No. 559,552
Claims priority, application France, Mar. 25, 1974, 74.10132
Int. Cl.² A63C 9/081
U.S. Cl. 280—618 **10 Claims**



1. A safety ski binding comprising a pivot member rigid with the ski, a pivoting plate means for supporting a ski boot, said pivoting plate being rotatably mounted on said pivot member, an abutment member mounted on said ski adjacent said pivoting plate, first and second ski boot retaining means mounted on said pivoting plate for releasably retaining the toe and heel ends of the boot, respectively, on said pivoting plate; means for slidably mounting said first retaining means on said pivoting plate; first resilient means for urging said first retaining means away from the toe end of the boot, and feeler means connected to the first retaining means and removably engageable with said abutment member, said feeler means engaging said abutment member to normally prevent sliding movement of said first retaining means away from the boot toe, said feeler means being pivotable with said pivoting plate and movable away from said abutment member after said pivoting plate has pivoted a selected distance to permit the first resilient means to slide said first retaining means along the pivoting plate to release said boot from the binding, and second resilient means mounted on said ski and coacting with said pivoting plate, said second resilient means applying a return torque to said pivoting plate upon pivoting movement thereof at least during pivoting movement over said selected distance.

3,966,219
SKI LOCK

Robert A. Look, 8404 W. Mercer Way, Mercer Island, Wash. 98040

Division of Ser. No. 322,906, Jan. 11, 1973. This application Oct. 23, 1974, Ser. No. 517,185
Int. Cl.² A63C 11/02
U.S. Cl. 280—611 **12 Claims**

3. A combination of a binding for a ski and a locking apparatus, said combination comprising:

a. a first bracket and a first binding being mounted on a first plate;

b. a second bracket and a second binding being mounted on a second plate;

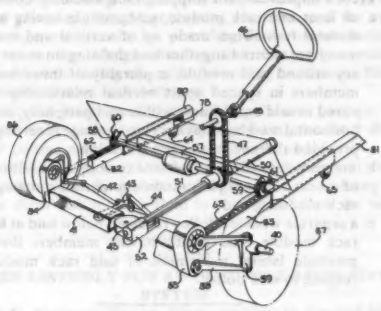
c. said first bracket and said second bracket being capable of fitting together; and,

d. a locking means for releasably securing together said first bracket and said second bracket.

3,966,220
VARIABLE LENGTH VEHICLE

Robert W. Forsyth, and John P. Forsyth, both of 1517 N. 3rd Ave., Upland, Calif. 91786

Division of Ser. No. 293,797, Oct. 2, 1972, Pat. No. 3,896,946. This application Jan. 7, 1974, Ser. No. 431,383
Int. Cl.² B62D 21/14
U.S. Cl. 280—638 **2 Claims**



1. In a passenger vehicle having an adjustable variable length wheelbase, the combination comprising:

an elongated frame;

said frame having a rear portion operably supporting the rear wheels of said vehicle and a movable forward portion carried in slidable relationship on said rear portion for operably supporting the front wheels of said vehicle;

a body carried on said frame having a portion thereof movable with said forward frame portion in response to movement of said forward frame portion with respect to said rear frame portion;

means interconnecting said forward frame portion with rear frame portion for limiting the extension and retraction of said front frame portion including said front body portion with respect to said rear frame portion;

steering means interconnecting said rear frame portion with said front frame portion operable to lengthen and shorten respectively following the movement of said front frame portion with respect to said rear frame portion and wherein said steering means includes a splined shaft sleeve carried on said rear frame portion and an externally splined shaft carried on said front frame portion in slidably fitted relationship with said sleeve so as to be operable to relatively move in a fore and aft manner as said elongated frame portions extend and retract while

allowing rotation of said sleeve and said shaft for simultaneous steering of said front wheels; and

power means operably interconnecting said rear portion and said forward portion for slidably moving said forward portion away from and towards said rear portion for simultaneously moving said front frame portion with respect to said rear portion and moving said steering shaft with respect to said steering sleeve.

3,966,221

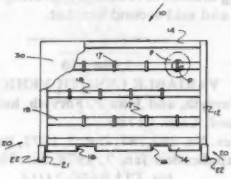
YARN SHIPPING RACK ASSEMBLY

John A. Beam, Greenville, and John D. Bane, Spartanburg, both of S.C., assignors to Hoechst Fibers Incorporated, Spartanburg, S.C.

Filed Nov. 15, 1974, Ser. No. 524,050

Int. Cl.² B62B 3/02

U.S. Cl. 280—79.3 15 Claims



11. An improved yarn shipping rack assembly comprising:

a. at least one rack module, said module having an outer skeletal framework made up of vertical and horizontal members secured together and defining an outer periphery around said module; a plurality of inner horizontal members in spaced apart vertical relationship and secured to said outer frame within said periphery, said inner horizontal members having yarn package receiving means provided thereon in staggered fashion;

b. means provided on said frame to cooperate with a frame of a next adjacent rack module to permit stacking of said rack modules; and

c. a separate wheeled dolley received below said at least one rack module, said dolley having members thereon to preclude lateral movement of said rack module with respect to said dolley.

3,966,222

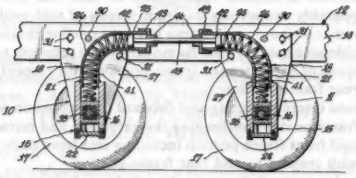
VEHICLE SUSPENSIONS

J. Phil Felburn, P.O. Box 2344, Arlington, Va. 22202

Filed Oct. 23, 1974, Ser. No. 517,367

Int. Cl.² B60G 11/16

U.S. Cl. 280—685 14 Claims



1. A wheel suspension for a vehicle having a frame, a wheel for rolling along a travel surface, such as a roadway and the like, and an axle on which said wheel is mounted, comprising:

a mounting for said axle whereby the latter may move vertically, said mounting having a portion connected to said frame and including a curved conduit,

a coil spring within said curved conduit, the convolutions of said spring engaging the inner wall surface of said curved conduit so that said coil spring is axially flexed to follow the curvature of said conduit, one end of said spring bearing against said axle,

abutment means against which the other end of said spring bears, and

means for adjusting said abutment to compress said spring a selected amount.

3,966,223

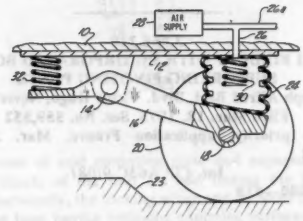
VEHICLE SUSPENSION

James P. Carr, 15005 Lear Lane, Silver Spring, Md. 20904

Filed Nov. 8, 1974, Ser. No. 522,165

Int. Cl.² B60G 11/46

U.S. Cl. 280—712 10 Claims



1. A vehicle suspension system comprising a source of relatively constant air pressure; an air bag functionally interposed between a road wheel and the vehicle sprung mass to provide a constant suspension force having a zero rate characteristic when the wheel is in a range of intermediate positions representative of normal run conditions; conduit means continually and non-restrictively connecting the bag to the source, whereby the bag internal pressure remains essentially constant throughout the wheel's intermediate positional range; an auxiliary normally inactive force means operable to introduce a progressively increasing additive force to the suspension system only when the wheel is deflected upwardly beyond its intermediate positional range; and a negative governing force means operable to progressively decrease the suspension system net support force only when the wheel is deflected downwardly from its intermediate positional range; the governing force means having a range of values that is sufficient to determine the vehicle suspension height.

3,966,224

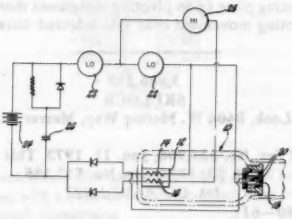
MULTIPLE INFLATION RATE OCCUPANT RESTRAINT SYSTEM

David D. Campbell, and Edwin H. Klove, Jr., both of Bloomfield Hills, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 3, 1971, Ser. No. 195,310

Int. Cl.² B60R 21/08

U.S. Cl. 280—735 1 Claim



1. A vehicle occupant restraint system comprising, in combination, source means actuatable to provide first and second

volumes of pressure fluid, an occupant restraint cushion inflatable from the source means, first control means responsive to the vehicle being subjected to an initial impact of predetermined minimum intensity not exceeding a predetermined maximum intensity to release the first volume of pressure fluid to the cushion and including time delay means providing a predetermined fixed time interval for actuating the source means to sequentially release the second volume of pressure fluid to the cushion after said predetermined fixed time interval, and second control means responsive to the occurrence within the predetermined time interval of the vehicle being subjected to a subsequent impact of intensity equal to or exceeding the predetermined maximum for actuating the source means to release the second volume of pressure fluid to the cushion within said predetermined fixed time interval.

3,966,225

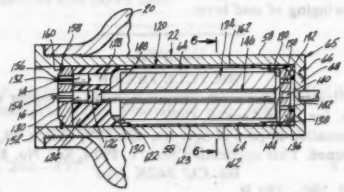
INFLATING DEVICE WITH SELF-CONTAINED PROPELLANT GAS GENERATING CARTRIDGE

Darrell W. Marlow, Herrin, Ill., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 286,361, Sept. 5, 1972. This application Oct. 11, 1973, Ser. No. 405,359

Int. Cl.² B60R *21/08*

U.S. Cl. 280—737 **4 Claims**



1. In an inflating device for use in connection with vehicle safety systems of the type including an inflatable confinement, a reservoir for storing a fluid under pressure, a cartridge receiving chamber extending into said reservoir and having an external opening at its outer end, means at the other end of said chamber sealing said chamber from said reservoir and operable upon a predetermined pressure to provide communication between said reservoir and chamber, a self-contained propellant gas generating cartridge secured within said chamber, said cartridge comprising an elongated tubular body portion formed integral with a head portion, said head portion and body portion formed from a resilient plastic material, a propellant charge positioned within said tubular body portion between said head portion and the other end, ignitor means positioned within said head portion for igniting said propellant charge, a nozzle member closing said other end of the cartridge adjacent the means sealing said chamber, said nozzle being held in place by folding over a portion of said body portion, means for reducing the throat area of said nozzle positioned within said cartridge, and means locking said cartridge within said chamber under a predetermined load.

3,966,226

FLUID SUPPLY FOR OCCUPANT RESTRAINT SYSTEM

Helmut Roth, Bloomfield Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 244,543, April 17, 1972, abandoned. This application Jan. 25, 1974, Ser. No. 436,400

Int. Cl.² B60R *21/08*

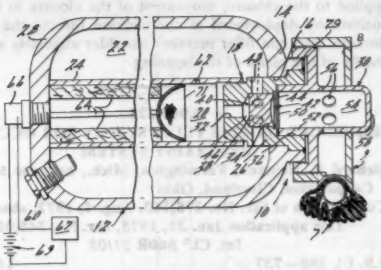
U.S. Cl. 280—737 **5 Claims**

1. A fluid supply for an occupant restraint system having a confinement with a collapsed inoperative condition and an expanded operative condition for restraining movement of an occupant of a vehicle during a collision of the vehicle and means for directing gas into the confinement to effect expansion thereof, the fluid supply comprising:

a vessel defining an elongated storage chamber adapted to hold pressurized fluid and an exit passage at one end of the vessel adapted for communication with the directing means and being generally concentric with the primary axis of the elongated storage chamber;

a tubular assembly passing through said exit passage and disposed concentrically within said elongated storage chamber substantially on said axis and defining a generating chamber concentric with said axis;

gas generating material located in the generating chamber and adapted to generate gas upon actuation;



means for providing fluid communication between the storage chamber, the gas generating chamber, and the exit passage, said means for providing fluid communication between the storage chamber and the gas generating chamber including means for providing continuous fluid communication therebetween;

a shear disk located within and sealing the exit passage;

a shear member having a cutting edge facing the shear disk for cutting an opening in the shear disk; and

means for moving the shear member through the shear disk in response to the generation of gas to cut the opening in the shear disk to allow fluid to be released from the vessel.

3,966,227

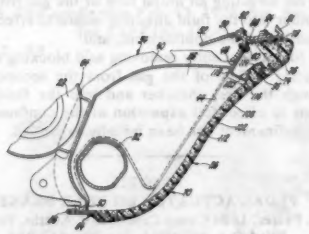
COVER ASSEMBLY FOR AN OCCUPANT RESTRAINT SYSTEM

Donald K. Cameron, Fraser, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 24, 1974, Ser. No. 517,794

Int. Cl.² B60R *21/08*

U.S. Cl. 280—752 **1 Claim**



1. In a vehicle body having an instrument panel structure, an occupant restraint cushion housing, an inflatable occupant restraint cushion deployable from the housing, a cover assembly mounted on the instrument panel structure and including flanges defining the side and upper edge portions of an opening to the housing, a flexible closure hinged to the lower edge portion of the opening for movement to an open position, and including flanges underlying the cover assembly flanges to releasably hold the closure against such movement, the

flanges at the side edge portions of the closure engaging the housing to block lateral movement of the side edge portions of the closure inwardly of the opening under inward pressure applied thereto, the improvement comprising, an elongated filler member secured to the housing and including an elongated shoulder extending angularly to the plane of the opening, said filler member also including an adjacent flange juxtaposed to the upper edge flange of the cover assembly and resiliently clamping the upper edge flange of the closure therebetween, and an elongated shoulder on the closure adjacent the upper edge flange thereof engaging the angular filler member shoulder to resist sliding movement in the general plane of the opening of the closure upper edge flange relative to the filler member flange under both inward and outward pressure applied to the closure, movement of the closure to an open position by deployment of the cushion forcing the closure shoulder past the filler member shoulder angularly and outwardly of the plane of the opening.

3,966,228

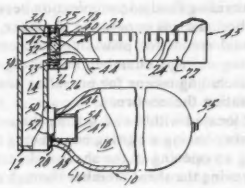
SEQUENCED ORIFICE FLUID SUPPLY FOR OCCUPANT RESTRAINT SYSTEM

Richard F. Neuman, Farmington, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 278,163, Aug. 4, 1972, abandoned. This application Jan. 31, 1975, Ser. No. 546,060

Int. Cl.² B60R *21/08*

U.S. Cl. 280—737 **11 Claims**



1. A fluid supply for an occupant restraint system having:

a confinement having a collapsed inoperative condition and an expanded operative condition for restraining movement of an occupant of a vehicle during a collision, said fluid supply comprising:

means for directing fluid into the confinement;

a vessel defining first and second pressure chambers fluidically in series;

gas under pressure in the first and second pressure chambers; means substantially blocking fluid flow between said first and second chambers;

means for directing an initial flow of the gas from the first chamber into the fluid directing means to effect an initial expansion of the confinement; and

means for subsequently removing said blocking means and directing a flow of the gas from the second chamber through the first chamber and into the fluid directing means to effect full expansion of the confinement after the confinement has been initially expanded.

3,966,229

PEDAL ACTUATED BICYCLE BRAKE

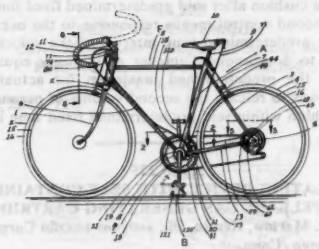
Edwin E. Foster, 1801 Camp Craft Road, Austin, Tex. 78746

Filed Oct. 10, 1974, Ser. No. 513,837

Int. Cl.² B62L *5/00*

U.S. Cl. 280—261 **29 Claims**

1. In combination with a bicycle having a frame, front and rear wheels supported on said frame, a pedal crank assembly with a main shaft and pedal cranks a drive sprocket carried on said main shaft, a driven sprocket engaged upon said rear wheel, a transmission chain interconnecting said drive and driven sprockets, and front and rear wheel caliper brakes, a brake control assembly comprising a lever swingably mounted on said frame for movement between an upper normal position and a downward position, means engaged upon said main shaft and to said lever, said means being adapted to bindingly restrict rotation of said main shaft upon back pedaling action whereby said lever is swung into downward position, means operatively engaged to said lever inhibiting tension in said transmission chain between said drive sprocket and said driven sprockets when said lever is in downwardly swung position, first and second cable means respectively connecting said lever and said front and rear wheel caliper brakes effecting braking action thereof upon downward swinging of said lever.



3,966,230

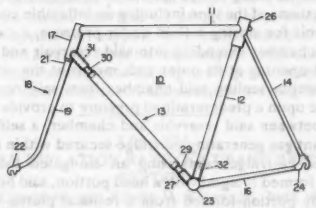
BICYCLE FRAME

John Nicol, Palos Verdes Peninsula, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 455,579, March 28, 1974, abandoned. This application Nov. 1, 1974, Ser. No. 520,043

Int. Cl.² B62K *3/04*

U.S. Cl. 280—281 R **1 Claim**



1. In a lightweight bicycle frame of the type including a tubular top bar having front and rear ends, a tubular set tube having top and bottom ends, a tubular head tube, a bottom bracket, and a tubular down tube, all of which are constructed of annealed titanium metal and which possess a combined weight of no more than four pounds, the improvement therein which includes:

a tubular sleeve of annealed titanium metal having an inner diameter slightly larger than the diameter of said seat tube and a wall thickness over a major portion thereof approximately equal to that of said seat tube and within the range of 0.032 inches to and including 0.035 inches;

said sleeve being fitted over and ensleevingly engaging a portion of said seat tube and extending from said top end of said seat tube to a predetermined short distance along said seat tube;

and wherein said tubular top bar is of a tubular diameter less than the diameter of said tubular sleeve and wherein said rear end of said top bar is of a cylindrical geometry concavely recessed from the end of said top bar for matingly

engaging the cylindrical outer surface of said tubular sleeve, said rear end of said top bar further being butted up against and fusion bonded to said outer surface of said tubular sleeve to form an integral juncture therebetween;

and wherein said tubular down tube is of a hollow cylindrical shape of a predetermined outer diameter and bore and a wall thickness in the range of 0.032 inches to and including 0.035 inches and contains at least one radially inwardly deformed portion adjacent an end, said deformed portion defining a cylindrical surface of smaller diameter and smaller bore than the major portion of said tube and being of a short length;

and a tubular mandrel of annealed titanium material, said mandrel being of a wall thickness approximately equal to the wall thickness of said down tube and having first and second ends and having a length greater than the length of said deformed portion of said down tube;

said tubular mandrel having a radially inwardly deformed portion spaced from and located between the said first and second ends thereof;

said deformed portion of said mandrel defining a cylindrical surface of outer diameter almost equal to said inner diameter defined by said deformed portion of said down tube and of a length approximately equal to that length defined by said deformed portion of said down tube;

said mandrel being located inside said down tube with said deformed portion of said mandrel underlying and engaging said deformed portion of said down tube and with the remaining portions of said mandrel engaging the inner surface of said down tube.

3,966,231

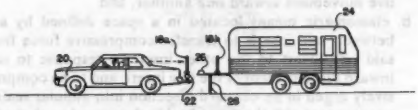
TRAILER ALIGNER

Robert P. Metzler, Ypsilanti, Mich., assignor to RPM Marketing Enterprises, Inc., Bloomfield Hills, Mich.

Filed Dec. 6, 1974, Ser. No. 530,238

Int. Cl.[2] B60D *1/06*

U.S. Cl. 280—477 **5 Claims**



1. A trailer aligner device for trailers equipped with a ball and socket type trailer hitch comprising in fixed non-rotatable combination an indicating rod having attached at one end thereof magnetic positioning means which is axially aligned with said rod, the gripping surface of said means is perpendicular to the longitudinal axis of said rod, said means being adapted to retain said device when positioned only on the top flat portion of the coupler ball whereby the bottom of the aligner device is engaged with the flat top portion of said ball and is disengaged from said ball by contacting said aligner with the socket of the trailer hitch.

3,966,232

PARKING CARDS

Joseph Doriel, Tel Aviv, Israel, assignor to P.I.D. Patents and Inventions Development Limited, Tel Aviv, Israel

Filed Dec. 30, 1971, Ser. No. 214,158

Claims priority, application Israel, Feb. 18, 1971, 36227

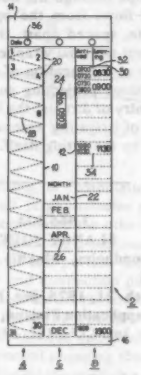
Int. Cl.[2] G09F *3/00*

U.S. Cl. 283—23 **4 Claims**

1. A parking card for displaying a prepaid parking time period, said card being in the form of a strip of tearable material having month, day and hour indicia printed on separate areas thereof, each of said indicia areas being formed with severance lines enabling the user to separate a part of the card in each of said areas along selected severance lines thereof to identify the month, day and the arrival and expiration times of the preselected prepaid parking time period;

the severance lines in at least one of said indicia areas each being in the form of a continuous cut defining a tab which may be pressed out of the card, the ends of each continuous cut terminating adjacent to but spaced from the edge of the card or another continuous cut, forming a connecting web portion between the card and the tab;

the tabs in at least one of said indicia areas being spaced along at least one edge of the card, each of said tabs having a generally triangular shape extending inwardly from the adjacent edge of the card to an apex and having



the earliest and latest permitted arrival times printed adjacent one end of the tab and the expiration time printed adjacent the opposite end of the tab to define the preselected parking time period associated with that tab; and

the relative lengths of the continuous cuts and connecting web portions, and the strength of the material providing the web portions, defining the respective tabs being such that the user may press each tab out of the card along said continuous cut, and pull same to cause the card to be torn along said connecting web portion, producing thereby a readily-discernible, irreversible alteration in the card.

3,966,233

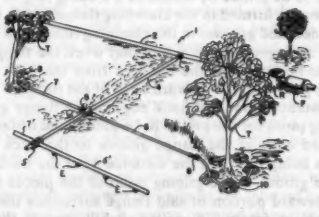
IRRIGATION APPARATUS

Richard E. Diggs, 12A Road, Rte. 3, P.O. Box 776, Carthage, Mo. 59101

Continuation-in-part of Ser. No. 498,181, Aug. 16, 1974, which is a division of Ser. No. 213,927, Dec. 30, 1971, Pat. No. 3,833,019. This application Feb. 13, 1975, Ser. No. 549,556

Int. Cl.[2] F16L *55/00*

U.S. Cl. 61—13 **5 Claims**



1. Irrigation apparatus, comprising a length of plastic pipe connected at one end with a source of irrigating water and

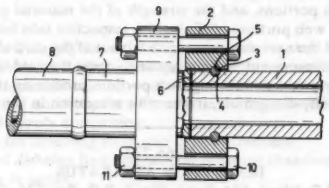
extending into an area to be irrigated, a plurality of self-piercing fittings inserted into the sidewall of the length of plastic pipe at spaced intervals along the length thereof for effecting desired localized flow of irrigating water into controlled root zones of plants to be irrigated, said fittings each including a sharpened piercing end inserted into the wall of the pipe and an integral shrouded discharge end projecting a substantial distance radially beyond the external surface of the pipe, said fitting having an axial bore therethrough for flow of water from the pipe into the shrouded end, said shrouded end having openings therein directed substantially perpendicular to the axis of the bore and to the axis of the pipe, whereby irrigating water exiting the pipe through the bore impinges against the shrouded end and flows from the openings therein, and a plurality of separate, spaced apart, thin, flexible, protective wraps of plastic sheet material wrapped around and engaging the fitting and pipe at the location of each fitting and having opposite edge portions projecting substantially beyond the fitting to prevent entry of dirt and the like into the fittings and to spread the flow of irrigating water over a larger area than that accomplished by the fitting itself.

3,966,234

FLANGE JOINT

Goran Vilhelm Sundholm, Makitie 4, Myllykyla, 01590 Maisala, Finland

Filed Feb. 21, 1975, Ser. No. 551,599
Claims priority, application Finland, Feb. 22, 1974, 532/74
Int. Cl.² F16L *23/00*
U.S. Cl. 285—24 **6 Claims**



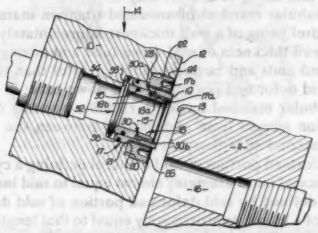
1. A flange joint comprising; a pair of tubular pieces to be joined, a clamping flange mounted on each of said pieces, a packing positioned between said pieces, means cooperating with said flanges for securing said pieces together, at least one of the clamping flanges turnably mounted on one of said pieces to be joined by means of a locking ring in corresponding grooves formed in the clamping flange and in said piece to be joined said grooves in the clamping flange and in said piece being arranged in such a way that when the flange is in position to be tightened the distance from the back edge of the flange groove to the forward edge of the flange is greater than the distance from said back edge of the flange groove to the joining point for the pieces to be joined, the distance from the forward edge of the flange groove to the back edge of the flange being less than the distance from the back edge of the flange groove to the joining point of the pieces to be joined, the forward portion of said flange surrounds the other piece and has an internal diameter slightly greater than the outer diameter of the other piece and thus forms a guide and a support for the other piece to be joined and for the packing fitted in between them.

3,966,235

UNDERWATER SEALING OF EXPOSED PORTS IN RELATIVELY CLOSABLE MEMBERS

George E. Lewis, Arcadia, Calif., assignor to Hydril Company, Los Angeles, Calif.

Continuation of Ser. No. 355,484, April 30, 1973. This application Feb. 10, 1975, Ser. No. 548,513
Int. Cl.² F16L *35/00*; E21B *43/01*
U.S. Cl. 285—25 **11 Claims**



1. For combination with first and second members having mutually opposed faces which are relatively movable toward and away from one another, the members defining ports to be brought into open registration in response to said member relative movement toward one another, improved sealing apparatus to seal off between said faces and about said registered ports, comprising

a. first and second concentric tubular inserts carried by one of the members for relative telescopic movement, the inserts extending about the port in said one member, at least one of the inserts having an end portion projecting endwise outwardly relative to said one member to be forcibly engaged by the other member for inwardly displacing said one insert in response to said member relative movement toward one another, and

b. elastomeric means located in a space defined by and between said inserts to transfer compressive force from said one insert to the other insert in response to said inward displacement of the one insert, and to be compressively urged in an outward direction into annular sealing engagement with the face of said other member about the port mouth therein,

c. said inserts having shoulders facing said space so as to have relative movement toward one another in response to said inward displacement of the one insert, both said inserts extending endwise inwardly beyond the innermost extent of said elastomeric means.

3,966,236

RELEASABLE COUPLING

Roy R. Vann, Box 38, Artesia, N. Mex. 88210

Filed Oct. 23, 1974, Ser. No. 517,391
Int. Cl.² F16L *37/22*
U.S. Cl. 285—39 **2 Claims**

1. A wireline actuated releasable fluid coupling apparatus which can be interposed within a tool string and arranged so that a wireline fishing tool can be used to part one marginal length of the string from the other, comprising:

an upper member having an upper end for attachment into an upper marginal length of a tool string;

a lower member having a lower end for attachment into a lower marginal length of a tool string;

means by which a marginal lower end of said upper member and a marginal upper end of said lower member can be slidably and telescopingly joined together in abuting relation, one within the other; seal means formed between said upper and lower member for precluding fluid flow therebetween;

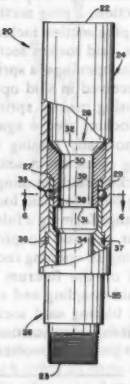
a releasing member; said upper member, said lower member, and said releasing member being concentrically arranged respective to one another, means forming an axial passageway through said upper member, said lower member, and said releasing member; said releasing member being slidably received within at least a portion of said marginal lower end and marginal upper end;

an annulus formed within the outermost of said upper and lower members, and a plurality of radially spaced apertures formed within a wall of the innermost of said upper and lower members;

said annulus and said radially spaced apertures jointly cooperate together to form a cavity; a marginal length of said releasing member being interposed between said cavity and said axial passageway;

said cavity being radially inwardly directed and jointly formed by a portion of the overlapping marginal ends of said upper and lower members;

a plurality of spherical objects of a diameter to be received within said cavity and to simultaneously bear against structure forming said annulus, said apertures, and said releasing member;



said releasing member having a wall surface thereof which bears against said spherical members to hold each said member within said cavity;

abutment means formed on a lower end portion of said releasing member for engaging a wireline fishing tool so that the releasing member can be engaged and moved axially upwards respective to the tool string to thereby communicate the cavity with the axial passageway; said releasing member having a shoulder formed thereon, said shoulder having a diameter greater than the diameter of the axial passageway in said lower member and abutingly engages the upper terminal end of said lower member to thereby limit the downward travel of said releasing member;

means, including said cavity, biasing said spherical objects axially inwardly toward said passageway so that a wireline fishing tool can be run downhole through the tool string and said releasing member engaged and moved axially to allow said cavity to communicate with said passageway, thereby causing said spherical objects to be forced from said cavity, and allowing said upper and lower members to slide apart from one another.

3,966,237

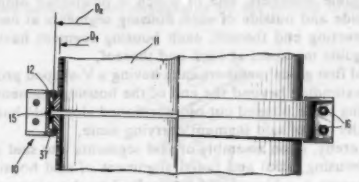
PIPE COUPLING FOR LARGE DIAMETER PIPE

Leo K. Thiessen, Shawnee Mission, Kans., assignor to Aeroquip Corporation, Jackson, Mich.

Continuation of Ser. No. 452,877, March 20, 1974, abandoned. This application June 23, 1975, Ser. No. 589,056

Int. Cl.² F16L *17/04*

U.S. Cl. 285—112 **2 Claims**



1. A pipe joint comprising, in combination,

two lengths of thin wall, large diameter pipe arranged end to end for connection one to the other,

each of said pipe lengths having a continuous, circumferential, enlarged diameter end portion thereon at the juxtaposed ends for pipe end connection purposes,

said end portions of substantial rectangular cross section, whereby to provide therewith a peripheral flat circumferential bearing surface thereon and a substantially radially extending circumferential engaging shoulder,

and mechanical coupling means overlying and engaging said enlarged diameter pipe end portions comprising:

a plurality of arcuate segments adapted for assembled positioning, in a group, as a complete, pipe-end-encircling, rigid, circular coupling housing;

each of said segments having an arcuate, outboard, with respect to the pipe lengths being connected, rectangular base portion;

said assembled housing segments having an inside diameter, at the concave inner faces of said rectangular base portions, greater than the outside diameter of the enlarged pipe end portions;

said segments having a width somewhat greater than the combined width of the two pipe end enlarged portions to be connected;

said housing segments each having a pair of radial projections extending inwardly from the concave inner face of the base portion, spaced inwardly from the side edges thereof and laterally from one another, whereby to form a gasket receiving groove therebetween;

the said radial projections, in the assembled housing, having an inside diameter slightly greater than the outside diameter of the enlarged pipe end bearing surface portions and adapted to overlie same;

said housing segments each having a pair of radial flange portions of greater depth than the depth of said projections extending radially inwardly from the side edges of said base portion, whereby to enclose and overlap, when the housing is assembled around the pipe ends, the two juxtaposed, aligned, enlarged diameter pipe end portions;

said radial flange portions having, in the assembled housing on the pipe, an internal diameter less than the outer diameter of the pipe end enlarged portions, but somewhat greater than that of the pipe lengths, per se, and a lateral spacing therebetween somewhat greater than the combined width of the two pipe end enlarged portions;

a C-section gasket positioned inboard of the segment housing base portions, retained laterally by the inboard radial projections and having a sealing portion engaging the peripheral bearing surface portion of each of the enlarged pipe end portions,

clamping means positioned at each end of each arcuate segment adapted to cooperate with like clamping means

on adjacent arcuate segments to form the circular housing; and

guide-interlock means positioned on each side of each arcuate segment and cooperating with like guide-interlock means on adjacent segment endings to rigidly retain and maintain the said segments coupled into the rigid circular housing, in cooperation with the said clamping means,

said guide-interlock means comprising first and second guide members, one of which is positioned along each side and outside of each housing segments at each connecting end thereof, each housing segment having two guide members at each end thereof,

said first guide members each having a V-shaped projection extending beyond the end of the housing segment carrying same, shaped cut-out positioned alongside but within the arc of said segment carrying same,

whereby, upon assembly of said segments into said circular housing, axial and radial alignment of said housing segments is achieved and maintained by the cooperation of the clamping and guide-interlock means.

3,966,238

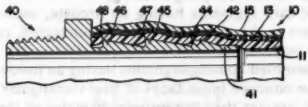
HOSE CONSTRUCTION AND HOSE COUPLING JOINT

Donald E. Washkewicz, Euclid, and Wayne S. Busdiecker, Stow, both of Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 465,183, April 29, 1975, abandoned. This application July 16, 1975, Ser. No. 596,254

Int. Cl.² F16L *33/00*

U.S. Cl. 285—239 **4 Claims**



1. A hose coupling joint comprising a fitting and hose having a bore therethrough, said fitting having an extension with a free end received within said bore, said extension having a circular barb thereon adjacent said free end and within said bore, said barb being tapered rearwardly at an acute angle with the longitudinal axis of said extension so as to have its largest diameter remote from said free end, said barb having a rear face that is substantially normal to said axis, said hose comprising a core tube, a braided tubular reinforcement of fibrous material over the core tube, said braid having an angle less than the neutral angle of the braid prior to insertion of such fitting extension into said hose bore, and a tubular cover over the reinforcement, at least one of said core tube and cover being of polyvinyl chloride plastic with a Shore A hardness between about 60 to 90 durometer, the inside diameter of said core tube being initially between about ¼ inch and ⅛ inch and said largest diameter of the barb being about 0.068 inch greater than said initial inside diameter of the core tube, whereby the barb diameter is within the range from substantially 124% greater than the initial hose inside diameter when such inside diameter is about ¼ inch to substantially 113% when the hose ID is about ⅛ inch, and said cover and core tube being bonded to said reinforcement with sufficient adherence whereby the pull required prior to assembly of the hose to the fitting to separate the core tube from the reinforcement is at least 8 lbs. and to separate the cover from the reinforcement is at least 12 lbs. on the test comprising separately peeling a one inch long strip of the cover from the reinforcement and the reinforcement from the core tube at the rate of one inch per minute.

3,966,239

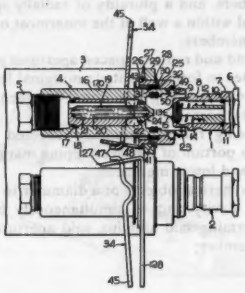
RELEASE FOR BREAKAWAY COUPLING

Edward B. Heckenkamp, Brookfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 16, 1974, Ser. No. 533,320

Int. Cl.² F16L *37/18*

U.S. Cl. 285—316 **10 Claims**



1. A release mechanism on a hydraulic fluid coupling comprising, a socket section, a plug section for reception in said socket section, said plug section including casing means defining a locking recess, said socket section including a housing means defining radial openings, a spring seat on said housing, locking elements received in said openings, a locking sleeve embracing said housing means, spring means compressively positioned in said locking sleeve against said spring seat on said housing and normally biasing said locking sleeve for locking said locking elements in said locking recess of said casing means for locking said coupling together, a hinge collar defining an opening receiving said locking sleeve of said coupling and an axial flange forming a fulcrum, a bracket supporting said hinge collar and said coupling through said locking sleeve, a lever defining an opening receiving said coupling and pivotally supported on the fulcrum of said hinge collar, a spacer encircling said coupling and engaging said spring seat and said lever and biasing said socket section against said spring means to a disengaging position relative to said locking sleeve responsive to pivotal movement of said lever.

3,966,240

QUICK-ACTION PIPE JOINT

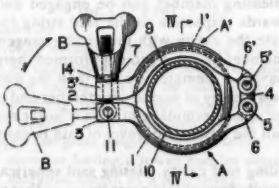
Michitoshi Enomoto, Osaka, Japan, assignor to Nakamura Kinzoku Kogyosho, Inc., Osaka, Japan

Filed Mar. 17, 1975, Ser. No. 558,721

Claims priority, application Japan, June 4, 1974, 49-66146

Int. Cl.² F16L *23/00, 19/02*

U.S. Cl. 285—367 **3 Claims**



1. A quick-action pipe joint comprising: a pair of opposed curved clamp members in which interior, tapered grooved portions are formed, for simultaneous engagement with and clamping of at least flange portions of two pipes to be joined; said members having terminal portions with respective cut-

outs therein, to engage a bolt having freedom of rotation at one end thereof; and recesses therein to mount a link with pins so as to rotate freely on a surface of the other end; and a nut including a body portion and a sleeve-shaped screw portion, for securing said clamp members at said one end in engagement with said bolt; wherein said clamp members and said nut body portion are mars produced by die-casting and molding from an aluminum alloy, said screw portion is made from an abrasion-resistant material such as steel, extends axially beyond the end of said body portion and is in abutting engagement with the terminal portion of one of said clamp members.

3,966,241

YARN KNOT

Charles Alonzo Jones; Jerry Joe Lawson, and William Carl Mayrose, all of Shelby, N.C., assignors to Fiber Industries, Inc., Charlotte, N.C.

Division of Ser. No. 242,775, April 10, 1972. This application Apr. 15, 1974, Ser. No. 461,199

Int. Cl.² D04G 5/00

U.S. Cl. 289—1.2 **4 Claims**

1. A yarn knot composed of two leading ends of continuous filament substantially uniformly underdrawn yarn, said ends being knotted about each other to form a unitary continuing yarn, the portion of said ends engaged in said knotted manner being substantially drawn, and the successive portions of said ends immediately adjacent said knotted portion being substantially uniformly underdrawn wherein said knotting is constituted by a self-tightening, balanced knot.

3,966,242

LOCKING MECHANISM IN PARTICULAR FOR A VEHICLE BONNET

Raymond Vitalis, Montbeliard, France, assignor to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of France

Filed Feb. 3, 1975, Ser. No. 546,776

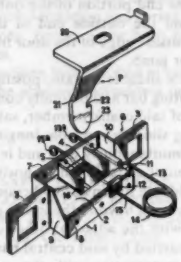
Claims priority, application France, Feb. 20, 1974, 74.05759

Int. Cl.² E05C 19/06

U.S. Cl. 292—19 **9 Claims**

1. A locking device for relatively movable first and second parts, comprising

a locking mechanism comprising two complementary sub-assemblies respectively forming a keeper and a bolt, a first of the sub-assemblies comprising a mount, a hair-pin shaped spring having a first branch and a second branch which branches have end portions which define eyes adjacent free ends of the branches, said end portions extending out of the mount, the first sub-assembly having means for holding a portion of the first branch adjacent said end portion stationary with respect to the mount transversely of the first branch while leaving the remainder of the spring free to be elastically deformed in a given plane so that the second branch is free to move elastically with respect to the mount transversely of the second branch in said plane between a locking position and an unlocking position, the first sub-assembly having means for precluding movement of the second branch in directions other than in said plane, a second of the sub-assemblies having a part engageable by the second branch in



said locking position of the second branch so as to be locked by the second branch when the two assemblies are brought together, the second sub-assembly being for mounting on the first part and the second sub-assembly being for mounting on the second part, and cable control means for shifting the second branch to said unlocking position in opposition to the elastically yieldable resistance of the spring, the control means comprising a cable and a sheath and the sheath being in abutting relation to the eye of one of the branches and stop means combined with the cable putting the cable in abutting relation to the other of said eyes.

3,966,243

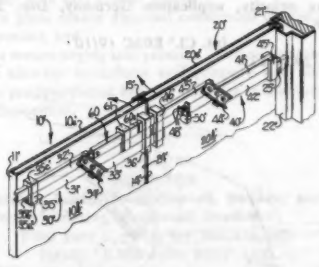
SECURITY BAR ASSEMBLY FOR DOUBLE DOORS

Robert I. Connell, 896 S. Main St., Mount Holly, N.C. 28120

Filed July 23, 1975, Ser. No. 598,201

Int. Cl.² E05C 7/04

U.S. Cl. 292—40 **9 Claims**



1. A security lock device for a side-by-side pair of hinged double doors comprising a pair of locking bar assemblies adapted to be mounted respectively on a common face of the pair of doors extending generally horizontally thereacross and being operable to permit lockingly securing the doors to the opposing door jambs and to one another, each locking bar assembly including

an elongate central mounting bar adapted for being securely mounted on the face of the door extending widthwise thereof with one end of the central mounting bar posi-

tioned adjacent the outside edge of the door and adjacent the door jamb and with the other end thereof positioned adjacent the inside edge of the door where the doors meet,

a relatively short crank member pivotally connected to said central bar and having opposite end portions thereof extending on opposite sides of the pivotal connection with said central bar,

an outer elongate slidable bar positioned alongside said elongate central mounting bar and pivotally connected to one of said end portions of said crank member and being slidably movable longitudinally along said central bar to position a free end portion of the outer slidable bar outwardly beyond the outside end of the central bar and beyond the outside edge of the door for engaging with the adjacent door jamb,

an inner elongate slidable bar also positioned alongside said central mounting bar and pivotally connected to the other end portion of said crank member, said inner slidable bar thereby being slidably movable longitudinally along said central bar simultaneously with and in the opposite direction to said outer slidable bar to position a free end portion of the slidable bar inwardly beyond the inside end of the central bar and beyond the inside edge of the door for engagement with the adjacent other door,

keeper means carried by said central bar adjacent each end thereof and cooperating with the respective outer and inner slidable bars for retaining said slidable bars in position alongside the central bar while permitting longitudinal sliding movement thereof. and

means carried by said central bar adjacent the inside end thereof for receiving and lockingly engaging with the extended free end portion of the inner sliding bar on the opposite door so that said pair of locking bar assemblies, when in the extended locked position, interlockingly engage one another at the opposing inside edges of the doors where the doors meet and also engage the door jambs along the outside edges of the doors to thereby maintain the pair of double doors in tightly locked position.

3,966,244

INSTALLATION FOR SECURING OF PIVOTAL HOODS OR FLAPS, ESPECIALLY ENGINE HOODS

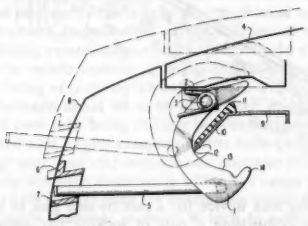
Werner Kleisser, Ostelsheim, and Götz Motting, Sindelfingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 23, 1974, Ser. No. 535,984

Claims priority, application Germany, Dec. 24, 1973, 2364466

Int. Cl.² E05C *19/10*

U.S. Cl. 292—127 **22 Claims**



1. An installation for securing pivotal members of vehicles, which can be unlatched from the interior space of the vehicle and can be released from the outside out of a stop position by a lever at a safety hook means, characterized in that the safety hook means is pivotally mounted at the pivotal member under a spring load and cooperates with a locally fixed countermember, said safety hook means upon release of the interior latching member being pivoted ay an upwardly directly movement of said pivotal member into a stop position in which said lever, which is pivotally mounted at the safety hook means, is displaced out of a normal cover-off position into an externally accessible position for the disengagement out of the stop position, said safety hook means is constructed sickle-shaped and is provided below the pivotal axis with a curved butting surface means which passes over on one side of the safety hook means into a detent notch provided with a locking nose portion which is adjoined by a crowned sliding surface, the fixed counter member includes a stop edge against which said curved butting surface means lies after a release of the latching mechanism, said curved butting surface means being slidable along the stop edge up to said locking nose portion to thereby move said lever from the normal covered-off position to the externally accessible position, and in that said crowned sliding surface is engageable with said fixed counter-member to deflect the safety-hook means away from the fixed countermember upon a closing of the pivotal member.

3,966,245

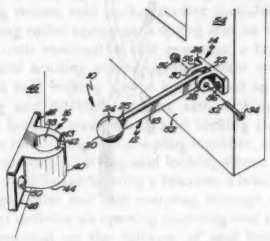
MULTIOPERATIONAL LATCH

Luigi G. Losenno, 3804 Thomas Ave. S., Minneapolis, Minn. 55410

Filed Jan. 30, 1975, Ser. No. 545,506

Int. Cl.² E05C *17/14*

U.S. Cl. 292—202 **10 Claims**



1. Multioperational latch for use with a door, having an inside surface, where the door can be placed in open and closed positions with respect to a door frame comprising in combination: an elongated latch member having a first end and a second end; the first end including a foot;

means for pivotally mounting the second end of the latch member to a first downward, privacy position, a second horizontal latch position, and a third upraised, nonoperative position; means for mounting the pivot means to the inside surface of the door; means for removably capturing and receiving the foot of the latch member; and means for mounting the receiving means in a stationary position with respect to the door frame, with the first privacy position of the latch member preventing the door from being moved from its closed position, the second position being where the foot of the latch member is captured within the receiving means holding the door in its open position, and the third position allowing the door to be freely moved either to or from its open or closed position.

3,966,246

DOOR LATCH FOR APPLIANCES AND THE LIKE

William H. Yake, Connersville, Ind., assignor to Design and Manufacturing Corporation, Connorsville, Ind.

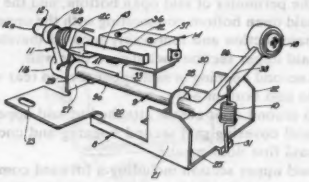
Filed Jan. 21, 1975, Ser. No. 542,653

Int. Cl.² E05C *3/22*

U.S. Cl. 292—241 **11 Claims**

1. An improved latch mechanism comprising a support plate having upstanding lugs in parallel spaced relationship with coaxial perforations therethrough, an L-shaped latch

lever the first leg of which comprises a rod-like portion rotatively mounted in said perforations of said support plate lugs, the second leg of said L-shaped latch lever comprising a handle portion with handle means at the end thereof, said latch lever being rotatable in said support plate lug perforations by said handle portion between an open position and a closed position, a link non-rotatively affixed to the free end of said first latch lever leg, a bolt means, means pivotally affixing said



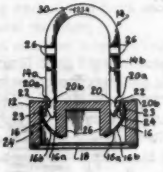
bolt to said link, said bolt means being independently swingable between a normal position and a latching position with respect to said link, means to bias said bolt to said normal position, a hookshaped strike, said bolt having a strike engaging portion, said strike having at least one cam surface thereon for engagement by said strike engaging bolt portion and so configured as to shift said bolt from said normal position to said latching position as said latch handle is shifted from said open to said closed position.

3,966,247

KEYLESS PADLOCK

Fred Muller, Jr., Florham Park, N.J.; Stanley Wolniak, Chicago, Ill.; Marshall Johnson, Mundelein, Ill., and Elbert Spencer, Wildwood, Ill., assignors to Madge Canter Associates, Inc., West Orange, N.J.

Filed June 4, 1973, Ser. No. 366,750
Int. Cl. E05c *19/18*
U.S. Cl. 292—318 **3 Claims**



1. A keyless padlock of the character described, comprising:

a. a lock body having a cavity formed therein, on one side thereof,

b. a seal plate secured to said lock body to close said open side,

c. a pair of spaced access holes formed in said lock body for access into said cavity and a pair of abutments formed in said lock body adjacent said access holes,

d. a generally U-shaped hasp consisting of a bight and a pair of generally parallel legs depending from said bight and adapted to be inserted into said lock body cavity through said access holes,

e. said hasp legs having a pair of barb formations at their lower ends, with downwardly directed cam-faces and upwardly directed abutment shoulders above said cam faces, and

f. lock spring means, confined in said lock body cavity between the abutments formed therein and the seal plate, for interlocking engagement with said hasp leg barb formations to interlock the hasp with the lock body,

g. said lock spring means comprising a generally U-shaped leaf spring having a bight and a pair of generally parallel arms extending upwardly therefrom and a pair of reception holes formed in said arms adjacent said bight,

h. said cam-faces on the hasp leg barb formations being oriented to engage the leaf spring arms, when the hasp legs are inserted into the lock body through said access holes, to cam said leaf spring arms laterally into spring-biased, non-parallel positions,

i. said hasp leg barb formations being registrable with the reception holes in the leaf spring arms when the hasp legs are fully seated in the lock body,

j. whereby the leaf spring arms are disengaged from the cam faces on said barb formation and spring back to generally parallel positions, trapping the barb formations in said reception holes,

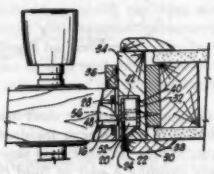
k. said barb formations being locked in said reception holes by means of the abutment shoulders on the barb formations.

3,966,248

SAFETY DOOR LOCK

Loyal W. James, P.O. Box 129, Chickasha, Okla. 73018

Filed June 29, 1972, Ser. No. 267,644
Int. Cl.² E05C *15/02*
U.S. Cl. 292—340 **6 Claims**



1. A door jamb keeper assembly for locking engagement with a door lock bolt, comprising:

an inset element for affixure within a door jamb adjacent to said door lock bolt;

a keeper element slidably retained in contact with said inset element and providing a lock aperture for receiving said door lock bolt;

pressure pad means formed from resilient material and being disposed contiguous to said inset element and in contact with said keeper element;

pressure plate means disposed contiguous to said pressure pad means; and

fastener means urging said pressure plate means toward said inset element to deform said pressure pad means and place predetermined keeping pressure in said bolt receiving disposition.

3,966,249

ROTATOR

Jonas Herman Lindqvist, Hudiksvall, Sweden, assignor to Hiab-Foco Aktiebolag, Hudiksvall, Sweden

Filed June 6, 1974, Ser. No. 476,852
Int. Cl.² B25B *1/00*; **B66C** *1/00*
U.S. Cl. 294—88 **4 Claims**

1. An improved rotator adapted to be positioned between a crane hoisting boom and a fluid actuated lifting tool, comprising in combination:

a rotator stand having a portion presenting a continuous vertical bore;

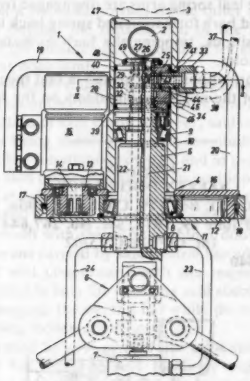
a vertical shaft having a lower end projecting downwardly from said stand, the remainder of said shaft being received in said bore;

bearing means disposed within said bore and engaging an intermediate section of said shaft for supporting said shaft

for rotation and against axial displacement, said shaft having an upper end projecting above said bearing means and located wholly within said bore, said bore being of larger diameter than said upper end of the shaft;

motor means carried by said stand and drivingly connected to said shaft below said bearing means for selectively rotating said shaft;

a sleeve enclosing said upper end of said shaft within said bore, said sleeve rotatably engaging said shaft and having an outer diameter less than the diameter of said bore



whereby said upper end of the shaft may freely flex laterally together with said sleeve incident to shaft loading without interference between said sleeve and said stand;

passage means defining a pair of fluid conduits extending through said sleeve and into said shaft to said lower end thereof for establishing pressure fluid connection between the upper and the lower ends of said shaft; and

means for preventing rotation of said sleeve relative to said stand while allowing said lateral flexing of the upper end of said shaft with said sleeve.

3,966,250

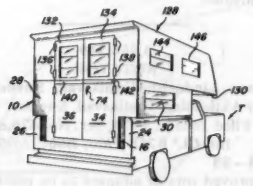
ENCLOSING STRUCTURE FOR THE LOAD BED OF A PICKUP TRUCK

Andrew B. Winskas, 504 Janine Lane, Schaumburg, Ill. 60172

Filed Jan. 27, 1975, Ser. No. 544,565

Int. Cl.² B60P 3/34

U.S. Cl. 296—1 R **2 Claims**



2. A pick up truck including a cab, a load bed comprising a floor, opposite side panels extending upwardly from the floor and a tailgate and including:

a. a base section removably supported on the floor of said bed and lying between said side panels,

b. said base section having an open top and including an upper edge generally defining the perimeter of said open top,

c. said base section including a rear wall,

d. a first opening in said base section rear wall extending to said upper edge,

e. first door means attached to said base section rear wall covering said first opening,

f. an upper section removably supported on said base section and having an open bottom,

g. means for attaching said upper section to said base section,

h. said open bottom having a lower edge generally defining the perimeter of said open bottom, and the lower edge of said open bottom cooperating with the upper edge of said base section and removably secured thereto,

i. said upper section including a rear wall,

j. a second opening in said upper section rear wall extending to said bottom edge,

k. a second door means attached to said upper section rear wall covering said second opening and cooperating with said first door means,

l. said upper section including a forward compartment and only said forward compartment extending substantially forward of said base section and above and over said pick up cab and said forward compartment having a closed bottom in advance of said upper section's open bottom, and

m. the closed bottom of said forward compartment lying in substantially the same plane as the bottom edge of said upper section,

n. said upper edge of said base section lying in substantially the same plane as the bottom edge of said upper section and above the plane of the roof of said cab, and

o. a roof covering said upper section.

3,966,251

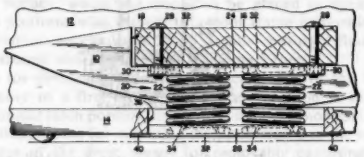
ROCKER SPRING UNIT

Adelard J. Belisle, South Hadley Falls, Mass., assignor to Dual Manufacturing and Engineering Incorporated, Holyoke, Mass.

Continuation of Ser. No. 270,054, July 10, 1972, abandoned. This application July 15, 1974, Ser. No. 488,305

Int. Cl.² A47C 3/02

U.S. Cl. 297—267 **5 Claims**



1. A rocker spring unit for a platform rocker chair of the type wherein a rocking component has rocker blocks associated with a rocker base comprising,

an upper spring retainer and a lower spring retainer,

spring means extending between and fixed to the upper and lower spring retainers,

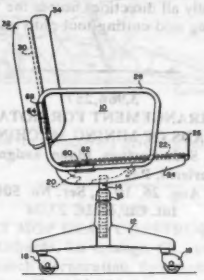
the rocker spring unit operably connected between the rocker base and rocking component, at least one of said rocker base or said rocking component having an opening through which the rocker spring unit passes,

and wherein the operable connection includes stops on at least one of the upper and lower spring retainers for precluding displacement of the rocker spring unit during rocking, the stops being non-pivotal relative to the spring retainers and comprising oppositely extending horizontally-disposed extensions on the spring retainers extending outwardly beyond the walls of said opening to prevent further movement of said at least one retainer through said opening.

3,966,252
CHAIR STRUCTURE AND TILT MECHANISM THEREFOR

Don C. Albinson, Coopersburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 28, 1974, Ser. No. 473,965
Int. Cl.² A47C 7/44
U.S. Cl. 297—306 **4 Claims**



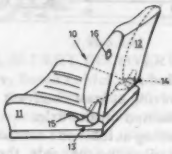
1. An improved chair construction for office type chairs and the like, comprising:
- a base for supporting the chair on a floor;
- a spindle extending substantially vertically from said base;
- a tilt mechanism connected to the upper end of said spindle, said tilt mechanism including first, second and third interconnected frame members, with said second frame member connected to said spindle;
- a chair seat structural member, having a molded shell on one side thereof and said molded shell having apertures on the side edges thereof, said first frame member connected to said chair seat structural member;
- a back mounting bar connected to said third frame member proximate the midpoint of said bar and extending laterally of said tilt mechanism in both directions;
- a pair of chair arms, one of said chair arms being fixed, within said molded shell through said apertures, to each laterally extending end of said back mounting bar;
- a chair back structural member;
- a chair back support member constructed and arranged to carry and support said chair back structural member, said chair back support member extending across the back of said chair and being secured at each extremity to one of said chair arms, whereby force applied to the back of said chair will cause said chair back to tilt with respect to said seat and said arms will move with said back.

3,966,253
VEHICLE SEAT WITH TILTABLE BACKREST

Hans-Joachim Berghof, Remscheid-Hasten; Hans-Gerd Hackländer, and Gerd Klingelhofer, both of Remscheid, all of Germany, assignors to Keiper KG, Remscheid-Hasten, Germany

Filed Apr. 28, 1975, Ser. No. 572,300
Claims priority, application Germany, Apr. 30, 1974, 15117
Int. Cl.² A47C 1/026; B60N 1/06
U.S. Cl. 297—367 **10 Claims**

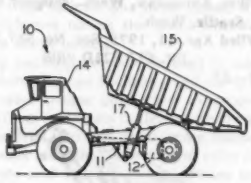
1. In a seat, particularly a vehicle seat, a combination comprising a pair of hinge fittings at opposite lateral sides of the seat and each including a first strap fixedly connected with the seat member of the seat, a second strap fixedly connected with the backrest member of the seat, a pivot connecting the respective first and second straps for relative pivotal movement, a gear segment on one of the straps of each of said pairs of straps, an engaging member on the respective other strap of each of said pairs of said straps and movable into engagement with the respective gear segments for preventing said pivotal movement, and biasing means biasing said engaging members into engagement with the respective gear segments; and control means for substantially simultaneously moving the engaging members of both of said hinge fittings out of engagement with the respective gear segments, said control means including on said other strap of each fitting a pivotally mounted first arm movable to and from a location in which it abuts the respective engaging member and prevents the same from moving out of engagement with the respective gear segment, a pivotally mounted second arm, a pivotally mounted third arm coupled with said second arm, the respective second and third arms being directly coupled with one another and with one end of a link by a coupling portion, the other end of said link being coupled to the respective first arm for joint movement of all said arms, and said control means further including a connecting member connecting the third arms of both fittings for substantially simultaneous movement, said control means also including a handle for effecting movement of one of said second arms so that such movement is transmitted to the other second arm via said connecting member.



3,966,254
TRANSMISSION NEUTRALIZER

Richard E. Guhl, Decatur, and Kenneth W. Renfro, Macon, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 4, 1975, Ser. No. 546,947
Int. Cl.² F16H 57/10
U.S. Cl. 298—22 C **10 Claims**



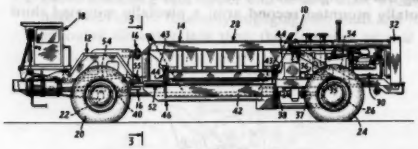
1. In a dump vehicle having a powered wheel drive including a transmission, manually operable transmission selector means selectively disposable in reverse, neutral, and forward positions, transmission control means responsive to said selector means for selectively arranging the transmission in corresponding reverse, neutral and forward positions for corresponding selective operation of the wheel drive, a dump body, and dump body control means including a manually operable control operable independently of said transmission selector means to selectively raise the dump body to a dump position for dumping a load therefrom and lower the dump body to a carrying position for carrying the load, the improvement comprising means responsive to said manually operable control for preventing reverse operation of the wheel drive irrespective of the disposition of the transmission selector means when the dump body control is arranged to move the dump body.

3,966,255

BOTTOM DUMP VEHICLE

Vincent Licari, Emmaus, Pa., assignor to Mack Trucks, Inc., Allentown, Pa.

Filed Mar. 5, 1975, Ser. No. 555,629
Int. Cl.² B60P 1/00
U.S. Cl. 298—35 M 11 Claims



1. In a vehicle including:

a. a front section having at least one front axle and a plurality of wheels mounted on the axle;

b. a rear section having at least one rear axle and a plurality of wheels mounted on the rear axle, the rear section also having a receptacle adapted to receive and carry loads; and

c. means articulative about a generally vertical axis for coupling together the front and rear sections;

the improvement comprising:

d. an engine mounted on the rear section of the vehicle;

e. drive train means operatively coupling the engine to the front wheels, the drive train means including at least one drive shaft extending lengthwise of the rear section of the vehicle;

f. a tunnel member on the rear section of the vehicle having at least a top cover portion and two laterally spaced apart side wall portions, the tunnel member extending lengthwise of the rear section of the vehicle and enclosing the drive shaft; and

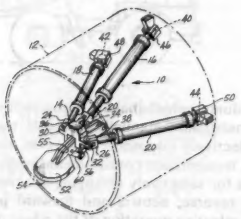
g. a pair of dump doors defining at least part of the bottom of the load-carrying receptacle and being mounted so as to be movable away from each other to produce a dump opening in the bottom of the load-carrying receptacle, the tunnel member extending lengthwise across the dump opening.

3,966,256

TUNNELING EQUIPMENT

Tyman H. Fikse, Enumclaw, Wash., assignor to The Robbins Company, Seattle, Wash.

Filed Apr. 11, 1975, Ser. No. 567,269
Int. Cl.² E21D 9/08
U.S. Cl. 299—33 25 Claims



1. An excavating mechanism for use in a tunneling machine that is advanced in the tunnel as excavation proceeds, said mechanism comprising:

a cutting tool;

a support tripod for said cutting tool comprising a tool mounting head and three double-acting hydraulic cylinders forming three variable length support and drive legs, each said cylinder having a forward end and a rearward end, and means connecting the forward end of said cylinders to said mounting head for pivotal movement about chordwise axes, said means otherwise transmitting moments between said mounting head and said cylinders, said cylinders being adapted to in use diverge rearwardly from said tool mounting head, and wherein the rearward ends of said cylinders are adapted to be mounted for universal pivotal movement and said cylinders are adapted to in use be selectively extended and retracted for moving said cutting tool forwardly and rearwardly and in substantially all directions across the tunnel face; and

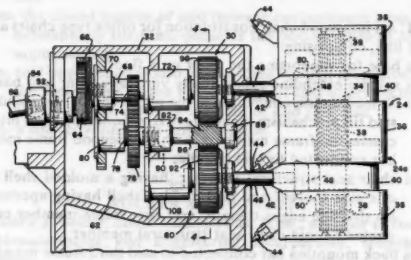
means mounting said cutting tool onto said tool mounting head.

3,966,257

DRIVING ARRANGEMENT FOR ROTARY MINING HEADS OF MINING MACHINES

Arvind K. Shah, Soda Springs, Idaho, assignor to Lee-Norse, Company, Charleroi, Pa.

Filed Aug. 26, 1974, Ser. No. 500,331
Int. Cl.² E21C 27/24
U.S. Cl. 299—76 10 Claims



1. A mining machine, comprising: a rotary mining head including at least one support rotatable about an axis, and cutter drum means carried by said support for rotation therewith, a gear box comprising gearing, a plurality of rotatable drive shafts separately and independently connected to said gearing to be rotatably driven thereby, means drivingly connecting said drive shafts to said support such that said drive shafts impart common rotary drive to said one support input means connected to said gearing for causing said gearing to drive said drive shafts; said support is disposed at a forward end of the mining machine; and said drum means extends lengthwise along said axis.

3,966,258

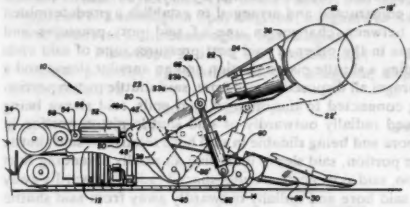
MINING BOOM LINKAGE FOR SEPARATE SUMP AND SWING CUTTING

Matthew J. Dolecki, Oil City, Pa., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Dec. 16, 1974, Ser. No. 532,750
Int. Cl.² E21C 27/24
U.S. Cl. 299—76 8 Claims

1. A mining machine comprising: an elongated main support; a cutter head support assembly including link means and an elongated rigid boom member; said link means being pivotally connected to said main support about a first axis fixed with respect to said main support; said boom member having one end portion pivotally connected to said link means about a second axis parallel to said first axis; a cutter head carried by said boom member on the free end thereof opposite said one end portion; said cutter head having an axis of rotation extending transversely of said boom member and having a length along said axis of rotation greater than the width of said main support; and actuator means communicating between

said main support and said cutter head support assembly for selectively pivoting said cutter head support assembly about



said first axis and for selectively pivoting said boom about said second axis.

3,966,259

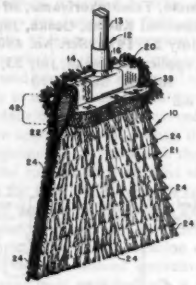
WET MOP HEAD CONSTRUCTION

Ernest Levon Richards, La Grange, Ga., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 523,884, Nov. 14, 1974, Pat. No. 3,924,289. This application Oct. 2, 1975, Ser. No. 618,850

Int. Cl.² A47L *13/20*

U.S. Cl. 300—21 **2 Claims**



1. A method of producing a wet mop head construction for attachment to the gripping elements of a mop tool comprising the steps of

1. providing a pile fabric,
2. cutting a plurality of rows of generally double-trapezoidal shaped pieces from a portion of said pile fabric with side edges of adjacent rows of said pieces contiguous,
3. folding each of said double-trapezoidal shaped pieces about their common shorter parallel side with the pile faces of each piece forming outer faces of the folded piece,
4. attaching a headband to overlie the folded edge of each piece, and
5. securing the headband thereto.

3,966,260

PRESTRESSED AXLE BEAM

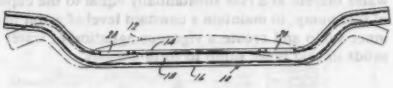
Eugene R. Braun, Royal Oak, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 7, 1975, Ser. No. 539,136

Int. Cl.² B60B *35/00*

U.S. Cl. 301—127 **5 Claims**

1. In a non driven axle suitable for supporting a vehicle thereon and comprising a one-piece beam section having means near each end of the beam for attachment of the axle to the vehicle, the improvement wherein the beam, when in an unloaded state, has a tensile residual stress in the top portion and a compressive residual stress in the bottom portion so that



when the axle is loaded during use the loading stresses on said axle will be partially neutralized by the residual stresses present in the unloaded beam.

3,966,261

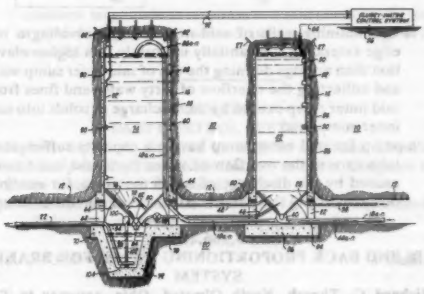
COAL SLURRY RECOVERY SYSTEMS

Richard E. Doerr; David L. McCain, both of Ponca City, Okla., and David H. Davis, Fairmont, W. Va., assignors to Continental Oil Company, Ponca City, Okla.

Filed June 30, 1975, Ser. No. 591,269

Int. Cl.² B65G *53/30*

U.S. Cl. 302—14 **9 Claims**



1. An improved slurry handling system for centralized reproportioning of slurried particulate material at a centralized mine tunnel location, comprising:

a water storage enclosure and means for conducting water to at least one mine tunnel work face;

a slurry storage enclosure and means for receiving slurried material from at least one mine tunnel work face, said slurry enclosure having the lower extremity formed to provide a slurry outlet;

slurry sump enclosure means disposed in said mine tunnel at said slurry storage enclosure and slurry outlet;

metering valve means connected to receive particulate material from said slurry outlet to provide positive metering of material into said slurry sump enclosure means;

conduit means including flow control valve for conducting water from said water enclosure means for input as reslurry water to said slurry sump enclosure means; and

slurry pump means and exit slurry line for moving slurry out of said sump enclosure means via said exit slurry line.

3,966,262

SUMP AND PUMP CONSTRUCTION FOR CONVEYING SOLIDS IN THE FORM OF A SLURRY

Walter D. Haentjens, Box 121, R.D. 1, Sugarloaf, Pa. 18249

Continuation of Ser. No. 371,038, June 18, 1973, abandoned. This application Mar. 24, 1975, Ser. No. 561,534

Int. Cl.² B65G *53/30*, *53/36*

U.S. Cl. 302—15 **6 Claims**

1. In an apparatus for conveying solids supplied in the form of dry solids at fluctuating rates and suitable for transportation in the form of a slurry,

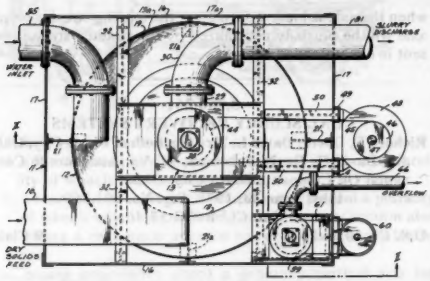
an outer sump having upstanding containing walls,

an inner sump fully contained within said outer sump and having upstanding containing walls spaced inwardly of said upstanding containing walls of said outer sump,

a conveyor conveying dry solids to said inner sump,

a pump having an inlet in direct communication with the bottom of said inner sump,

a supply line for water leading to said inner sump, supplying water thereto at a rate substantially equal to the capacity of said pump, to maintain a constant level of water in said inner sump and create a vigorous agitation of water and solids in said inner sump to form a slurry,



said containing walls of said outer sump providing a top edge extending substantially uniformly to a higher elevation than an edge defining the top of said inner sump walls and collecting the overflow of dirty water and fines from said inner sump caused by the discharge of solids into said inner sump, and

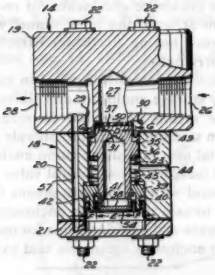
a pump for said outer sump having a capacity sufficient to take care of the overflow of water from said inner sump caused by the discharge of solids thereinto, for continuously removing the water and fines from said outer sump.

3,966,263

BLEND BACK PROPORTIONING VALVE FOR BRAKE SYSTEM

Richard G. Thrush, North Olmsted, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Aug. 25, 1975, Ser. No. 607,476
Int. Cl.² B60T 8/26
U.S. Cl. 303—6 C **14 Claims**



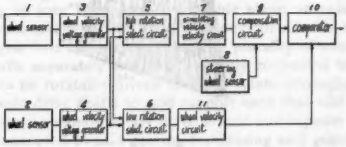
1. In a motor vehicle air brake system having a source of high pressure air and a plurality of air brake actuators, a pressure proportioning valve; said pressure proportioning valve comprising a housing having an inlet port connected to said source of high pressure and an outlet port connected to said brake actuators, a bore between said inlet port and said outlet port, a shuttle piston slidably disposed in said bore, said shuttle piston having an inlet end and an outlet end and a valve surface, said valve surface being disposed on said inlet end, said valve surface being constructed and arranged to open and close pressure communication through said bore between said inlet port and said outlet port in response to a pressure unbalance on said inlet and outlet ends of said shuttle piston, said inlet and outlet ends each having a predetermined net lateral cross-sectional area exposed to the fluid pressure in said inlet and outlet ports respectively, said net inlet and outlet areas being different from one another by a predetermined ratio and being constructed and arranged to establish a predetermined ratio between changes in one of said port pressures and changes in the other of said port pressures, one of said ends including a shuttle piston portion and an annular sleeve and a diaphragm all disposed in said bore, said shuttle piston portion being connected to the other of said ends, said sleeve being disposed radially outwardly of said shuttle piston portion in said bore and being slidable in said bore relative to said shuttle piston portion, said sleeve including an axially extending skirt portion, said skirt portion being spaced radially inwardly away from said bore and radially outwardly away from said shuttle piston portion, said skirt portion and said bore cooperatively defining an annular outer diaphragm cavity, said skirt portion and said shuttle piston portion cooperatively defining an annular inner diaphragm cavity, said diaphragm having a radially outer peripheral portion secured to said housing and a radially inner center portion secured to said shuttle piston portion, and said diaphragm extending axially from its radially outer peripheral portion into said outer diaphragm cavity and extending axially from its radially inner center portion into said inner diaphragm cavity.

3,966,264

COMPENSATION FOR ANTI-SKID BRAKE CONTROL SYSTEM

Hiroaki Mattori, Yamatokoriyama; Takemi Mizuta, Osaka, and Shinzi Okamoto, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed July 22, 1974, Ser. No. 490,303
Claims priority, application Japan, July 23, 1973, 48-82905
Int. Cl.² B60T 8/10
U.S. Cl. 303—21 BE **6 Claims**



1. In an anti-skid brake control system of the slip modulus type, for use in a vehicle having at least a wheel and a steering wheel, in which pressure reduction signals for the purpose of reducing the brake pressure are generated when the slip modulus exceeds a predetermined value, an arrangement for preventing the erroneous generation of brake pressure reduction signals when the vehicle is making a turn comprising:

a wheel sensor provided adjacent to the wheel for generating wheel velocity signals in response to the rotational velocity of the wheel;

means for generating simulated vehicle velocity signals in response to the wheel velocity signals;

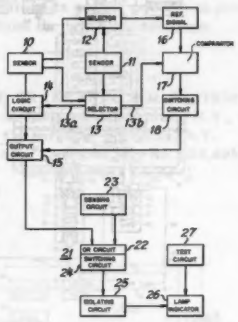
a steering wheel sensor for generating steering angle signals in response to the angle of the steering wheel; a compensation circuit for reducing the value of the simulated vehicle velocity signals in response to the steering angle signals; and

a comparator for comparing the wheel velocity signals with output signals of the compensation circuit, the comparator producing pressure reduction signals for reducing the brake pressure of the brake system within the vehicle when the difference in value between the wheel velocity signals and the output signals of the compensation circuit is beyond a predetermined value.

3,966,265
FAULT DETECTING SYSTEM FOR VEHICLE ANTI-SKID CONTROL SYSTEMS

Robert Ernest Taylor; Mervyn Brian Packer, and David Parsons, all of Leamington Spa, England, assignors to Automotive Products Ltd., Leamington Spa, England

Filed Sept. 3, 1974, Ser. No. 502,854
Claims priority, application United Kingdom, Sept. 14, 1973, 43301/73
Int. Cl.² B60T 8/08
U.S. Cl. 303—21 AF **6 Claims**



1. A fluid pressure operated braking system comprising fluid carrying lines for supplying fluid under pressure to a brake of a vehicle, at least one electrical system operatively connected with a wheel of the vehicle to regulate the braking force applied to said wheel, said electrical system being operable automatically to effect release of said brake acting on said wheel when the deceleration thereof exceeds a predetermined amount and to re-apply said brake when the angular velocity of said wheel approaches that at which the periphery of said wheel rolls on the road surface without slipping, means for sensing the time for which said brake is released and operative, if the sensed time is greater than a predetermined time, to actuate an isolating circuit which renders inoperative said electrical system to permit re-application of said brake, said electrical system being rendered operative again when the ignition of the vehicle is switched off, a solenoid operated valve having an armature operatively connected with said electrical system and connected in the fluid lines of the braking system, said solenoid valve being operable in response to signals produced by said electrical system to relieve fluid pressure in a fluid line to thereby effect said brake release, means for sensing the position of the armature of said solenoid valve, said sensing means being connected to said isolating circuit and being operable to actuate said isolating circuit when said solenoid valve remains in a condition to relieve fluid pressure for more than a predetermined time.

3,966,266
SKID CONTROL SYSTEM

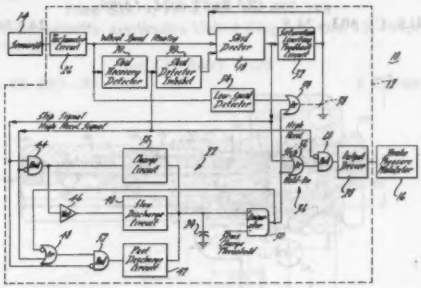
Thomas M. Atkins, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Continuation-in-part of Ser. No. 393,727, Sept. 4, 1973, abandoned. This application Nov. 13, 1974, Ser. No. 523,426
Int. Cl.² B60T 8/08
U.S. Cl. 303—21 P **67 Claims**

19. A skid control system for a vehicle having a wheel and a brake for the wheel comprising:

a wheel speed sensor for providing an output signal representative of the speed of the wheel; and

skid detecting means including a capacitor, a transistor and a biasing circuit for said transistor being responsive to said wheel speed sensor output signal and arranged for providing an output signal having a first substantially constant magnitude in response to a skid condition having a severity between first and second predetermined degrees of severity and a second different substantially

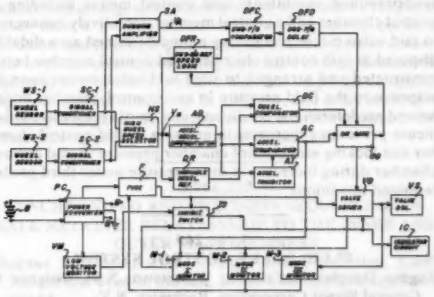


constant magnitude in response to a skid condition having a severity above said second predetermined degree of severity.

3,966,267
SKID CONTROL SYSTEM

Joseph H. McNinch, Jr., Oak Park; John A. Urban, Livonia, and Gary L. Hopkins, Southfield, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 326,676, Jan. 26, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,218
Int. Cl.² B60T 8/02
U.S. Cl. 303—21 BE **9 Claims**



1. A skid control system for use with a vehicle having at least first and second spaced apart independently rotatable wheels and having a braking system for applying braking forces to said wheels and comprising:

brake control means responsive to a skid signal for controlling said braking system to release the braking forces on said wheels;

means for providing first and second wheel speed signals of magnitudes respectively representative of the wheel speeds of said first and second wheels;

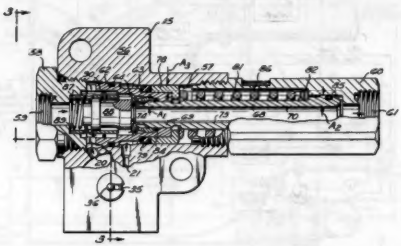
logic circuit means for providing a skid signal when the acceleration rate of the faster of said wheels exceeds a predetermined positive acceleration; and

means for inhibiting said logic circuit means from providing said skid signal when the positive acceleration rate of the faster wheel attains a level representative of a second predetermined acceleration greater and more positive than that of said first predetermined acceleration.

3,966,268
INERTIA LOAD SENSING BRAKE VALVE

Edward S. Orzel, Cleveland, and Richard G. Thrush, North Olmstead, both of Ohio, assignors to The Weatherhead Company, Cleveland, Ohio

Filed Mar. 12, 1975, Ser. No. 557,677
Int. Cl.[2] B60T 8/26, 13/06
U.S. Cl. 303—24 F 24 Claims



1. A motor vehicle hydraulic brake system comprising a front brake circuit, a rear brake circuit having a pressure proportioning valve for reducing the pressure supplied to the rear wheel brakes relative to the pressure supplied to the front wheel brakes, and control means altering the pressure proportioning characteristics of the proportioning valve in accordance with the load of the vehicle; said proportioning valve including an inlet, an outlet, a bore connecting said inlet and outlet, a proportioning piston slidably disposed in said bore and having a net inlet area exposed to fluid pressure in said inlet and a net outlet area exposed to fluid pressure in said outlet, valve means responsive to movement of said proportioning piston in said bore maintaining increases in outlet pressure proportional to but less than increases in inlet pressure by a predetermined proportional relationship under first predetermined conditions; said control means including a control chamber and a control member operatively connected to said valve means and having a predetermined area slidably disposed in said control chamber, said control member being constructed and arranged to urge said valve means open in response to the fluid pressure in said control chamber under second predetermined conditions, and inertia responsive valve means preventing increases in pressure in said control chamber and locking said control chamber pressure in said control chamber during increases in inlet pressure under third predetermined conditions.

3,966,269
FLUID BRAKE CONTROL SYSTEM

Eugene Douglas McEathron, Watertown, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

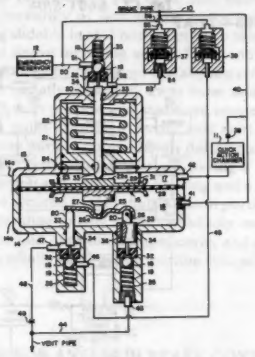
Filed Sept. 12, 1975, Ser. No. 612,840
Int. Cl.[2] B60T 15/30, 15/52
U.S. Cl. 303—37 26 Claims

1. A fluid brake control system for a train of cars including a car having a brake control pipe, a reference fluid reservoir subject to charge periodically from the brake pipe and an improved quick service control device comprising:

a. a housing containing a fluid pressure differential operated abutment subject to actuation from a normal position by differences in pressure between respective brake pipe and reference fluid pressure chambers acting on opposite sides of the abutment,

b. two poppet type valve means on the brake pipe pressure chamber side of the abutment for selectively venting the chambers, each of the valve means being spring biased in the direction of the abutment to a normally closed position and the valve means having respective operating push rods longitudinally disposed between the associated valve means and the abutment, and

c. the poppet valve means being responsive to movement of the abutment in one direction to vent first the brake pipe fluid pressure chamber and thereafter the reference fluid pressure chamber to alternately reverse the differential in fluid pressure acting on the opposite sides of the abutment to thereby reciprocate the abutment cyclically,

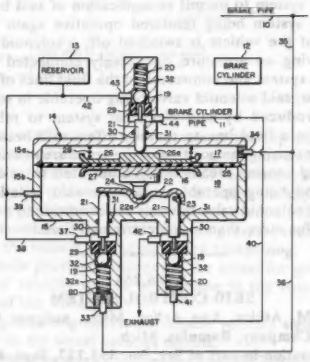


d. whereby the poppet valve means are opened and closed in turn so as to intermittently reduce the pressure in the brake pipe as long as the brake pipe pressure is being reduced independent of action of the poppet valve means.

3,966,270
FLUID BRAKE CONTROL SYSTEM

Eugene Douglas McEathron, Watertown, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Aug. 13, 1975, Ser. No. 604,404
Int. Cl.[2] B60T 15/32
U.S. Cl. 303—69 7 Claims



1. A fluid brake control system for a vehicle having a brake pipe, a brake cylinder pipe governing fluid pressure in a brake cylinder, and a reference fluid pressure reservoir wherein an improved brake application and release control device is provided for governing fluid pressure in the brake cylinder pipe comprising;

a. a housing containing a differential abutment subject to actuation from a normal position by differences in pressure between respective brake pipe and reference fluid pressure chambers on opposite sides of the abutment,

b. at least one poppet type valve means disposed in the housing on each of said opposite sides of the abutment spring biased in the direction of the abutment to a closed position and the valve means having an operating push rod axially disposed between the associated valve means and the abutment,

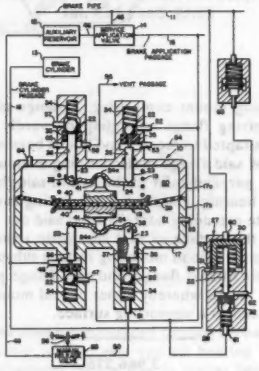
c. the poppet valve means on one side of the abutment being opened by movement of the abutment in one direction from its normal position to permit charging of the brake cylinder pipe, and

d. the poppet valve means on the other side of the abutment being opened by movement of the abutment in the opposite direction from its normal position to permit fluid to be released from the brake cylinder pipe.

3,966,271
FLUID BRAKE CONTROL SYSTEM

Eugene Douglas McEathron, Watertown, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Aug. 13, 1975, Ser. No. 604,405
Int. Cl.² B60T *15/32*
U.S. Cl. 303—69 **7 Claims**



1. A fluid brake control system for a vehicle having a brake control pipe, a fluid reservoir, a brake cylinder, and a service valve governing flow of fluid from the reservoir through brake application and brake cylinder passages successively to the brake cylinder, wherein an improved brake cylinder release control device comprises;

a. a housing containing an abutment subject to actuation from a normal position by differences in pressure between a release spring in a chamber on one side of the abutment and pressure selectively applied to the abutment by another chamber on the opposite side of the abutment,

b. at least one poppet type valve means on each side of the abutment spring biased in the direction of a valve seat disposed between the associated valve means and the abutment,

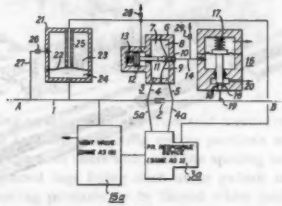
c. the poppet valve means on one side of the abutment being normally closed against its seat and opened by movement of the abutment in opposition to the pressure of the release spring for releasing fluid from the brake cylinder, and

d. the poppet valve means on said other side of the abutment being maintained open normally by action of the release spring against the abutment and being closed by movement of the abutment in opposition to the pressure of the release spring for preventing flow of fluid from the brake application passage to the brake cylinder passage.

3,966,272
RAIL VEHICLE BRAKING SYSTEM WITH IMPROVED BRAKE SIGNAL PROPAGATION

David John Wickham, London, England, assignor to Westinghouse Brake & Signal Company Limited, Chippenham, England

Filed Oct. 9, 1974, Ser. No. 513,398
Claims priority, application United Kingdom, Oct. 13, 1973, 47918/73
Int. Cl.² B60T *11/28*
U.S. Cl. 303—81 **8 Claims**



1. In a rail vehicle braking system having a brake pipe through which fluid signals are propagated for control of brakes of the vehicle, an arrangement for improving signal propagation in the brake pipe, comprising valve means connected with said brake pipe and operable when actuated to effect enhancement of a predetermined brake pipe pressure change produced by flow in the brake pipe, fluid flow sensor means connected with said brake pipe for controlling said valve means to effect said enhancement in response to sensed fluid flow rate in said brake pipe, and override means responsive to fluid conditions in said pipe for inhibiting operation of said arrangement except upon the occurrence of a predetermined pressure change to be propagated in said pipe, so as to render said arrangement nonresponsive to pressure changes of other than a predetermined sense and to steady pressure gradients and flow as might be caused by a leak in said system, said override means comprising a pressure change detector in the form of a pressure sensitive member subjected on opposing faces to fluid conditions in said pipe, and delay means for delaying changes of fluid conditions on one face relative to the other face upon a pressure change in said pipe.

3,966,273
SYNCHRONIZED AND PRECISION SEQUENCING OF BALL RETAINER RELATIONSHIP TO THE INNER AND OUTER SLIDE MEMBERS

Magnus F. Hagen, 3713 Twilight Drive, Fullerton, Calif. 92632, and Fred A. Jordan, 14906 Lodosa, Whittier, Calif. 90605

Filed Sept. 13, 1974, Ser. No. 505,902
Int. Cl.² F16C *29/04*
U.S. Cl. 308—3.8 **20 Claims**

1. Telescoping linear motion synchronized ball bearing slides, comprising:

an outer slide member having a longitudinally extended bottom wall;

a strip of material having a multiplicity of protrusions thereon secured to the inner side of the bottom wall of said outer slide member and extending longitudinally thereof;

an inner slide member having a longitudinally extending top wall parallel to the bottom wall of the outer slide member;

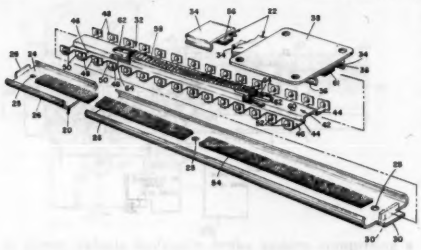
a strip of material having a multiplicity of protrusions thereon secured to the inner side of the top wall of the inner slide member, said strip of material extending longitudinally of said inner slide member;

ball races along the side edges of the outer and inner slide members, the ball races along adjacent side edges of the

respective slide members being operably positioned to receive ball bearings therein;

ball bearings in said races for retaining said members together for longitudinal movement relative to each other;

a ball retainer longitudinally movable between said slide members and having parts for operably retaining the balls in longitudinally spaced relationship in said ball races, said ball retainer having a longitudinally extending part parallel to the bottom and top walls of said outer and inner slide members;



an endless band of flexible material having a multiplicity of protrusions thereon;

band mounting means spaced apart on the ball retainer on which the band is operably mounted and over which ends of the band pass with a rolling movement, said band including planar portions at opposite sides of the ball retainer between said mounting means at all times being in random and meshing positive interlocking engagement with the adjacent strips of the slide members to preclude slippage therebetween.

3,966,274

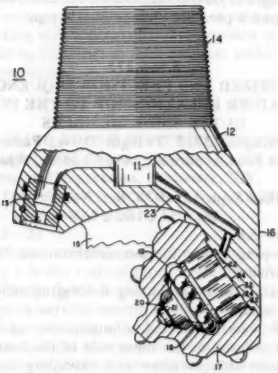
ROLLER SEPARATOR FOR BIT BEARINGS

Samuel Lee Penny, Lancaster, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 13, 1975, Ser. No. 549,606

Int. Cl.² F16C *19/04*

U.S. Cl. 308—8.2 **8 Claims**



1. A rotary rock bit, comprising:

a bit body;

at least one bearing pin extending from said bit body;

a cutter member rotatably positioned on said bearing pin;

a plurality of cylindrical rollers positioned between said bearing pin and said cutter member; and

a plurality of floating independent separator elements positioned between said bearing pin and said cutter member, each individual separator element positioned between a pair of adjacent rollers.

3,966,275

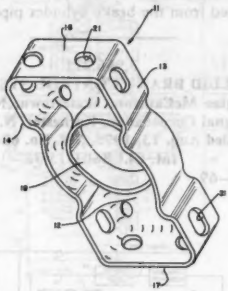
BEARING MOUNT

Earl S. Cain, Portola Valley; Jerome A. Carlson, Woodside, and George E. Goodrich, San Carlos, all of Calif., assignors to Tribotech, Redwood City, Calif.

Filed July 26, 1974, Ser. No. 492,214

Int. Cl.² F16C *13/00*

U.S. Cl. 308—15 **17 Claims**



1. A bearing mount comprising: a flange plate having a bearing receiving flange extending outwardly of one face thereof and adapted to receive and hold a bearing therein, the other face of said flange plate defining a mounting surface substantially perpendicular to the axis of said flange for positioning said bearing mount on a supporting surface; at least one side plate extending laterally from said one face adjacent said flange, the surface of said side plate remote from said flange defining a second mounting surface substantially parallel to the axis of said flange; and said flange plate and side plate having means whereby either of said mounting surfaces may be secured to a supporting surface.

3,966,276

AUTOMATIC PLAY TAKE-UP JOURNAL BUSHINGS

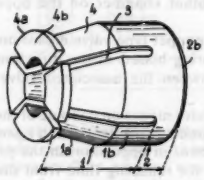
Raymond Bellarbre, and Marcel Legavre, both of Boulogne-Billancourt, France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Jan. 9, 1975, Ser. No. 539,806

Claims priority, application France, Jan. 11, 1974, 74.01067

Int. Cl.² F16C *33/00*

U.S. Cl. 308—238 **2 Claims**



1. A bushing for receiving a pin or trunnion of a mechanism subjected to medium or moderate loads and for force-fitting into a bearing comprising, a body having an annular cross-sectional shape and an equal radial thickness throughout the length thereof for accommodating the pin or trunnion, a radi-

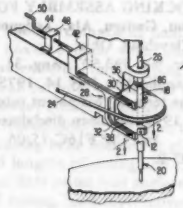
ally extending, outwardly directed flange on one end of said body having at least one longitudinally extending resilient portion adjacent said one end for radial outward movement by the pin or trunnion accommodated within the body and at least one longitudinally extending substantially rigid portion adjacent the other end of said body, said resilient body portion comprising at least one longitudinally extending portion of frusto-conical shape, said frusto-conical portion having a plurality of circumferentially spaced, longitudinally extending slots, said slots extending through said flange to define a plurality of resilient segments each provided at their outer ends with a portion of said flange, said flange portions being angularly disposed with respect to the longitudinal axis of said body for yielding engagement with one end of the bearing in which the bushing is mounted and with a cooperating surface on the pin or trunnion accommodated within said body to thereby eliminate axial movement between the bearing and the pin or trunnion.

3,966,277

VEE BEARING HAVING ADJUSTABLE V JOURNAL PROFILE

John A. Cupler, II, 10 Cupler Drive LaVale, Cumberland, Md. 21502

Filed Sept. 6, 1974, Ser. No. 503,749
Int. Cl.² F16C *23/02*
U.S. Cl. 308—36 **8 Claims**



1. A Vee bearing having spaced bearing element pairs defining a V journal profile; said spaced bearing element pairs comprising diamond inserts having planar bearing surfaces; means for adjusting said V journal profile; said means including adjusting means for equal adjustment of said bearing surfaces toward and away from the journal axis of said V journal profile; said adjusting means including diamond insert mounting means mounted for movement toward and away from said axis; cooperating means on said diamond insert mounting means and said Vee bearing for insuring said equal adjustment of said bearing surfaces; and said cooperating means comprising cam means on said diamond insert mounting means and cooperating cam means mounted for equal collective movement relative to the diamond insert mounting means to insure equal collective adjustment of said bearing surfaces.

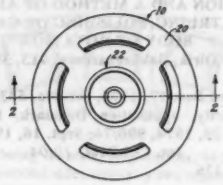
3,966,278

LUBRICATED SELF-ALIGNING BEARING ASSEMBLY

John G. Lewis, Dellwood, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Nov. 13, 1974, Ser. No. 523,344
Int. Cl.² F16C *11/06, 23/04, 25/04*; F16N *7/12*
U.S. Cl. 308—72 **5 Claims**

1. In a spherical bearing assembly, a bearing retaining member having a cylindrical wall, where the inner wall surface thereof has an integrally formed transverse wall within said cylindrical wall, a first annular seat formed in said transverse wall, a spherical bearing having a spherical surface near one end thereof engaging said seat, a plurality of circularly spaced, integrally formed lugs projecting inward from said cylindrical wall surface having abutment surfaces, a high-rate leaf spring having a central portion, an aperture in said central portion defined by a second annular seat in engagement with a spherical surface portion of said bearing near its other end, said leaf spring having portions projecting radially from said central portion with the outer ends thereof lying within said cylindrical wall and engaging said abutment surfaces, said abutment



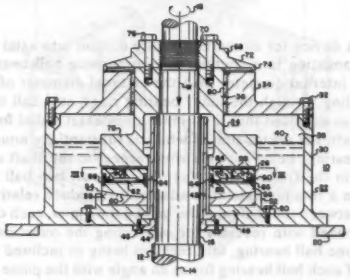
surfaces being so spaced axially from said transverse wall as to require said radially projecting spring portions to be flexed when in engagement therewith, and the spacing between said circularly spaced lugs being such as to permit said radially extending spring portions to be flexed when positioned between said lugs so they may be rotated in a flexed condition into engagement with said abutment surfaces.

3,966,279

HIGH-LOAD CAPACITY, NON-TILTING THRUST BEARING

Albert A. Raimondi, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 6, 1975, Ser. No. 584,429
Int. Cl.² F16C *17/06*
U.S. Cl. 308—160 **5 Claims**



1. A thrust bearing for supporting a rotating shaft, a portion of said shaft having a thrust runner mounted securely thereon, said bearing comprising:

a bearing housing having a fluid cavity therein, said shaft extending through said housing so that said thrust runner is disposed within said fluid cavity;

a bearing pad having an upper and a lower axial surface thereon disposed within said housing so that said upper surface is adjacent to said thrust runner in a shaft supporting position, said pad having a pocket disposed on said lower surface thereof and a step disposed on said upper surface thereof;

a lubricating fluid disposed within said cavity, said lubricating fluid forming a hydrodynamic film between said upper surface of said pad and said thrust runner when said shaft is rotating, said hydrodynamic film being disposed within said step provided on said upper surface and having a predetermined pressure existing therein when said shaft is rotating; and

means for conducting a portion of said pressurized hydrodynamic film into said pocket to form a hydrostatic film of

fluid between said lower surface of said pad and said housing to support said pad away from said housing.

3,966,280

DEVICE FOR CONVERTING ROTARY MOTION TO AXIAL MOTION AND A METHOD OF APPLYING THE DEVICE FOR TRUING, POLISHING OR CALIBRATING A BODY OF ROTATION

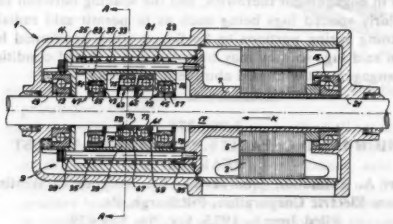
Henrik Gerner Olrik, Bakkegaardsvej 413, 3050 Humlebaek, Denmark

Filed Dec. 17, 1974, Ser. No. 533,724

Claims priority, application Denmark, Dec. 17, 1973, 6826/73; Feb. 25, 1974, 990/74; Sept. 16, 1974, 4850/74

Int. Cl.² F16C *19/04*

U.S. Cl. 308—176 **33 Claims**



1. A device for converting rotary motion into axial motion and consisting in a friction unit comprising ball bearings of larger internal diameter than the external diameter of a shaft extending through the inner bearing rings, said ball bearings being so disposed that their inner rings exert radial forces on the shaft, the vector sum of which is substantially nought, the ball bearings being inclined with respect to the shaft axis and wherein the friction unit comprises at least two ball bearing jaws in a retaining member adapted to produce relative rotation between the shaft and the ball bearing jaws, each of which is provided with recesses for supporting the outer ring of at least one ball bearing, said recesses being so inclined that the axis of each ball bearing forms an angle with the plane defined by the shaft axis and the abutment of the inner ring of the said ball bearing against the shaft, the friction unit being further provided with clamping means adapted to clamp the ball bearing jaws more tightly against the shaft in response to an increase of the axial load on the shaft.

3,966,281

BEARING SUPPORT FOR A ROTATABLE REGENERATIVE HEAT EXCHANGER

Klaus Wiegard, Esslingen-Zollberg, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

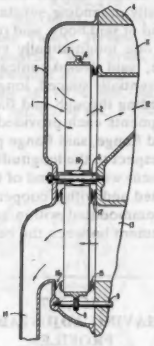
Filed Oct. 11, 1973, Ser. No. 405,278

Claims priority, application Germany, Oct. 11, 1972, 2249763

Int. Cl.² F16C *19/00*

U.S. Cl. 308—202 **25 Claims**

1. A bearing support for a rotatable regenerative heat-exchanger in disk form which is rotatably supported on support shaft means characterized in that the bearing support includes roller bearing means having approximately barrel-shaped roller bodies whose length is a multiple of their thickness, said roller bearing means including inner bearing surface means formed by a concave surface portion with a radius of



curvature which is larger than the radius of curvature of curved outer surfaces of the barrel-shaped roller bodies.

3,966,282

BEARING CHOCKING ASSEMBLY FOR MILL ROLLS

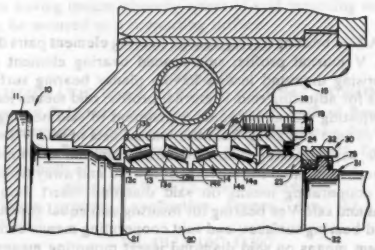
Harold C. Overton, Gadsen, Ala., assignor to Republic Steel Corporation, Cleveland, Ohio

Division of Ser. No. 393,507, Aug. 31, 1973, Pat. No. 3,912,345. This application July 14, 1975, Ser. No. 596,431

The portion of the term of this patent subsequent to Oct. 14, 1992, has been disclaimed.

Int. Cl.² F16C *35/06*

U.S. Cl. 308—207 R **21 Claims**



1. A bearing chocking device positionable on a shaft in engagement with a formation on the shaft, the device being operable to chock a shaft journaling bearing structure which bearing structure is at a location spaced axially from the formation, the device comprising:

a. a first ring structure including a plurality of ring segments each segment being coactable with the shaft formation for axially locating the segments, the first ring structure defining first cam surfaces;

b. a second ring structure having second cam surfaces engageable with said first cam surfaces to effect axial movement of said second ring structure toward and away from the bearing structure as said second ring structure is rotated relative to said first ring structure;

c. retaining means establishing a connection between said one of the ring structures and the shaft to prevent rotation of said one ring structure relative to the shaft when said ring structures are rotated relatively; and

d. connection means for securing said ring structures together once said second ring structure has been positioned to properly chock the bearing structure.

3,966,283

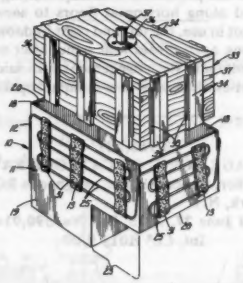
REFRIGERATION APPARATUS AND METHOD FOR MAKING SAME

Richard L. Puterbaugh, St. Cloud, Minn., assignor to Franklin Manufacturing Company, St. Cloud, Minn.

Continuation of Ser. No. 366,752, June 4, 1973. This application Dec. 12, 1974, Ser. No. 532,151

Int. Cl.² B65D *5/56*

U.S. Cl. 312—214 7 Claims



1. A refrigeration cabinet comprising heat conducting elements, including a box-like inner liner and a plurality of lengths of interconnected refrigeration tubing extending along a plurality of outer wall surfaces of the liner and in heat conducting relation by direct contact with said wall surfaces, an outer shell in spaced relationship to the inner liner, a first layer of insulating foam, having been foamed in place, covering at least portions of said lengths of tubing and covering and adhering to areas of the liner outer wall surfaces between adjacent lengths of said tubing, said layer covering sufficiently large areas of said wall surfaces and sufficient portions of said lengths of tubing and having sufficient rigidity to serve as the sole means securing and maintaining said tubing in heat conducting relationship with said wall surfaces but being of less thickness than the space between said inner and outer shell, and a second layer of insulating foam compatible with the foam of said first layer, said second foam layer having been foamed in place over the first layer and filling the space between said outer shell and said first foam layer and any portions of said tubing and wall surfaces not covered by said first layer, said first and second layers of foam each having a thermal conductivity coefficient representative of rigid insulating foam whereby together they provide heat insulation throughout substantially the entire space between said wall surfaces and tubing and said outer shell.

3,966,284

SNAPPABLE OPEN SEPARATORS FOR THE CAGE OF ROLLING THRUST BEARING ELEMENTS

Jacques Lucien Joseph Martin, Paris, France, assignor to R.K.S. Societe Anonyme, France

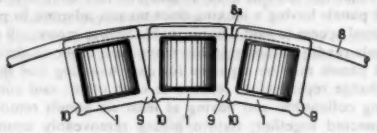
Filed Mar. 19, 1974, Ser. No. 452,567

Claims priority, application France, Mar. 20, 1973, 73.09979

Int. Cl.² F16C *19/20*

U.S. Cl. 308—235 12 Claims

1. An apparatus, housing a rolling thrust-bearing element, for use with other apparatuses of the same type housing other thrust-bearing elements, which apparatuses are assembled together with a ring to form a cage, having an axis, for the elements, said apparatus housing a roller thrust-bearing element comprising: a separator including an opening in which the element is located, a first side having a groove which cooperates with the ring, and a second side opposite said first side and for facing the axis of the cage, said second side including first and second cylindrical surfaces having the same radius and axes parallel to the axis of the cage, said first and



second surfaces being located, respectively, in the vicinity of the ends of said second side, whereby one separator may nest with adjacent separators by the cooperation of said first and second surfaces on the one separator with complementary surfaces on adjacent separators.

3,966,285

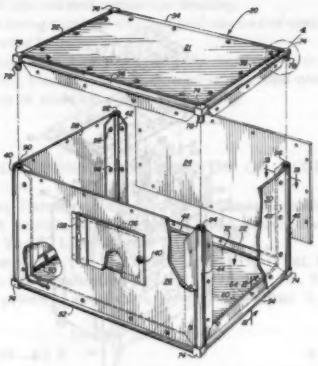
COLLAPSIBLE SHIPPING CONTAINER

Don E. Porch, 5026 E. Earl, Phoenix, Ariz. 85018; Paul W. Manktelow, 8310 E. Lewis, Scottsdale, Ariz. 85257, and James E. Utz, 6608 S. 43rd Place, Phoenix, Ariz. 85040

Filed July 17, 1974, Ser. No. 489,446

Int. Cl.² A47B *43/00*; B65D *7/00*

U.S. Cl. 312—257 R 2 Claims



1. A collapsible and reusable shipping container which, in total, is too large for manual handling; said container comprising a box-like structure having corners, said box-like structure provided with a first pair of side structures; a top; and a bottom; said container adapted to rest on any one of said side, top or bottom structures; said side, top and bottom structures all having opposite edges; elongated tubular frame members each having open opposite ends and disposed at all of said edges; joint members disposed at said corners, and said frame members all intersecting said joint members at said corners; each of said joint members having three prongs, each of said prongs disposed in one of said open ends of said hollow tubular frame members; each hollow tubular frame member having a longitudinal axis and having a pair of flat elongated longitudinal flanges; each pair of flanges being parallel with said longitudinal axis of a respective frame member; each of said flanges extending laterally from each respective hollow tubular frame member; the flanges of each of said pairs being spaced angularly apart; each flange having a plurality of first disengageable fixture means spaced longitudinally thereof; at least two of said sides, top or bottom structures having a panel member overlapping at least four of said flanges of four respective

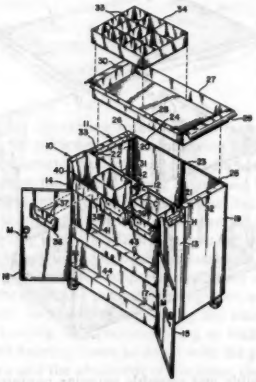
frame members; and second disengageable means cooperative with each of said first disengageable means for removeably holding said panels fixed on respective frame members, each of said prongs readily slidably removed from each respective one of said open ends when respective disengageable means is disengaged; said disengageable fixture means being accessable from the interior only of said box-like structure; one of said panels having a locking door means, adapted to provide manual access to said disengageable fixture means; all of said panels readily disconnectable from each other so that all of said panels may be separate for easy handling and shipping exchange replacement relative to each other; said container being collapsible and having at least six panels removeably connected together; fixture means removeably connecting said panels in an enclosing assembly; all six of said panels readily disconnedctable from each other so that all of said panels may be separate for easy manual handling and shipping exchange replacement; said fixtures accessible only from inside said container; at least one of said panels having a locking door means to provide access to said removeable fixture means internally of said container.

3,966,286

BLOOD-SPECIMEN PROCUREMENT CART

Pauline Inez Groseclose, 611 E. Bonds St., Carson, Calif. 90745

Filed Oct. 31, 1975, Ser. No. 627,539
Int. Cl.² A47B 43/00
U.S. Cl. 312—258 **10 Claims**



1. A blood-specimen procurement cart for carrying medical supplies comprising, in combination:

a. a rigid cabinet portion including a vertical rear panel, left and right rigid side panels secured to and extending forwardly from said rear panel, and front cabinet doors hinged to the forward vertical edges of the rigid side panels;

b. a folding cabinet portion including left and right foldable side panels hinged to and extending rearwardly from said rear panel when in unfolded positions, and rear cabinet doors hinged to the rearward vertical edges of said foldable side panels;

c. a flat rectangular rear shelf of given length and width dimensions horizontally hinged along one longitudinal edge to the rear surface of said rear panel a distance below the upper edge of said rear panel at least as great as the width of said shelf;

d. engaging means on the inner sides of said foldable side panels at a level corresponding to the hinge level of said shelf;

e. forward left and right rollers secured beneath said rigid cabinet portion; and,

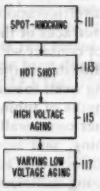
f. rear left and right rollers secured to the bottom edges of said left and right foldable side panels adjacent to the hinge points of said rear cabinet doors respectively, whereby when said left and right foldable side panels are swung outwardly from said rear panel into alignment with said left and right rigid side panels, said shelf may be swung downwardly until opposite sides of the shelf engage said engaging means so that said shelf is level and holds the foldable side panels in their unfolded positions to stabilize said folding cabinet portion and whereby said rear left and right rollers are spaced rearwardly of said rear panel to provide rolling stability with said forward left and right rollers for said rigid cabinet portion and foldable cabinet portion so that the resulting cart may be easily rolled along horizontal floors to service patients and when not in use, the left and right foldable side panels can be swung against said rear panel after swinging said shelf upwardly into flat engagement with said rear panel, and the cart easily stored in a compact space.

3,966,287

LOW-VOLTAGE AGING OF CATHODE-RAY TUBES

Paul Richard Liller, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed June 27, 1975, Ser. No. 590,914
Int. Cl.² H01J 9/00
U.S. Cl. 316—1 **10 Claims**



1. In a method of processing a completed cathode-ray tube having an electron gun including a cathode, a control electrode, a screen electrode, a focus electrode and a high-voltage electrode, the method including the steps of spot-knocking, hot-shot, high-voltage aging and low-voltage aging, the improvement comprising applying a varying positive voltage to said focus electrode and a constant positive voltage to said screen electrode during the low-voltage aging step of said processing.

3,966,288

METHOD FOR MAKING HIGH INTENSITY DISCHARGE ARC TUBE

William A. Finch, Marblehead; Frederick A. Loughridge, Ipswich, and Rudolf Marcucci, Beverly, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Division of Ser. No. 390,538, Aug. 22, 1973, Pat. No. 3,905,795. This application Dec. 12, 1974, Ser. No. 532,078
Int. Cl.³ H01J 9/18
U.S. Cl. 316—19 **1 Claim**

1. The method of making an arc tube for a high intensity discharge lamp comprising the steps of: rotating a length of vitreous quartz tubing; heating by means of a movable heater an intermediate portion of said length to the softening point; rapidly moving the heater away from the tubing and moving a closable two piece mold proximate the softened portion of the tubing; closing the mold around said softened portion and admitting pressurized gas into the softened portion to blow the

tubing into the shape of the mold which is arch shaped; severing the unnecessary length of tubing; sealing electrodes in the

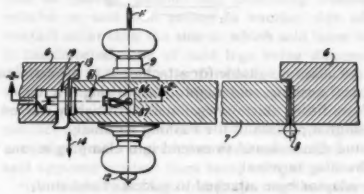
ends of the molded portion of the tubing; and exhausting and filling to form a completed arch shaped arc tube.

3,966,289

ELECTRIC POWER COUPLER

Ernest L. Schlage, 219 Bloomfield Road, Burlingame, Calif. 94010

Filed May 16, 1975, Ser. No. 578,080
Int. Cl.² H01R *39/00*
U.S. Cl. 339—4 **14 Claims**



8. An electric power coupler for use with first and second door members relatively movable along a predetermined path toward and away from substantial abutment comprising a first frame adapted to be mounted on said first door member, said first frame having a recess therein with an opening laterally in the direction of said path, at least a first electrical connector extending parallel to said path, means for mounting said first connector on said first frame in said recess and directed toward said opening, a second frame adapted to be mounted on said second door member, a plunger having a chamber therein with an aperture open laterally in the direction of said path and complementary to said opening, means for mounting said plunger on said second frame for movement relative thereto in a direction normal to said path, at least a second electrical connector extending parallel to said path, means for mounting said second connector on said plunger and in said chamber directed toward said aperture and toward said first connector, and a conductor on said second frame and joined to said second connector.

3,966,290

POLARIZED CONNECTOR

David Murray Little, Harrisburg, and Gary Lee Zimmerman, Shermansdale, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 478,206, June 11, 1974. This application July 2, 1975, Ser. No. 592,428
Int. Cl.² H01R *13/64*; H05R *1/06*
U.S. Cl. 339—17 LC **2 Claims**

1. A polarized connector, comprising:

a first connector housing mounted on a printed circuit board and having a plurality of pins therein,

an opening in said first connector housing encircled by chamfered edges defining a funnel entry,

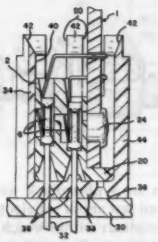
a second connector housing having a plurality of receptacles therein for receiving in mating engagement said pins,

said second connector housing being mounted on an edge margin of a printed circuit board,

a lip on said second connector housing flush with one end thereof and covering an edge of said printed circuit board,

said lip and said one end of said second connector housing being chamfered on the peripheral edges thereof for ease in insertion within said funnel entry,

said pins being arranged in rows within said first connector housing offset toward a side of said first connector housing,



said receptacles being arranged in rows within said second connector housing and including tail portions projecting therefrom for mounting within said printed circuit board,

said receptacles being of different distances from said one end of said second connector housing,

said pins being received through said one end of said second connector housing, and

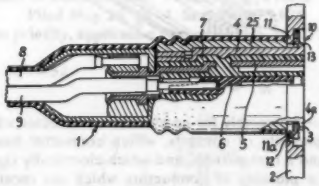
said receptacles being sequentially received over corresponding pins during insertion of said second connector housing in said first connector housing.

3,966,291

ELECTRICAL CONNECTOR MOUNTED ON A SUPPORT PLATE

Alfred Jean Théodore Hug, Zurich, Switzerland, assignor to ARFINA Anstalt fur Continentale und Vebersee-Finansinteressen, Vaduz, Liechtenstein

Division of Ser. No. 365,628, May 31, 1973, Pat. No. 3,894,782. This application Apr. 18, 1975, Ser. No. 569,262
Claims priority, application Switzerland, June 2, 1972, 8238/72
Int. Cl.² H01R *13/62*
U.S. Cl. 339—64 R **4 Claims**



1. An electrical connector comprising an element mounted on a support in a direction substantially perpendicular to the said support and passing through an orifice in the said support, in which play is provided, in the plane of the said support, between at least a portion of the said connector element and the said support, with said element passing through a washer with play between the said element and the edge of an internal orifice of the washer, the said washer itself being arranged in an orifice in the support with play between the outer periphery of the washer and the edge of the said orifice in the support, means being provided to substantially immobilize the said

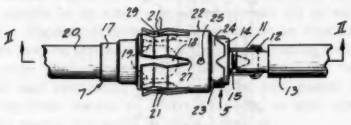
element and the said washer relative to the support longitudinally of the connector.

3,966,292

PHONOJACK WITH GROUNDING TAB CLAMPING MEANS

Ronald L. Schultz, Northfield, Ill., assignor to Chromalloy-Alcon Inc., Chicago, Ill.

Filed Oct. 15, 1974, Ser. No. 514,615
Int. Cl.² H01R *13/54, 17/08*
U.S. Cl. 339—91 P **9 Claims**



1. In combination in a phonojack assembly including a tubular grounding shell fast about a dielectric support carrying a phonojack socket contact within which a phonoplug pin is receivable, the grounding shell providing a perimeter area of substantial length longitudinally slideably engageable by plug shell tulip finger tabs pushed onto said area from one end of said area, the improvement comprising:

separate resilient clamping fingers biased toward said perimeter area for thrusting the plug shell tulip finger tabs received between said clamping fingers and said area into positive electrical contact with said area; and

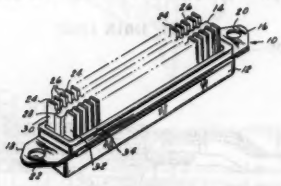
means fixedly secured to said grounding shell at the opposite end of said area and fixedly mounting the nearest ends of said clamping fingers.

3,966,293

HOOD ASSEMBLY FOR AN ELECTRICAL CONNECTOR

Istvan Mathe, Cicero, and Ronald Richard Maros, Elmhurst, both of Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Dec. 30, 1974, Ser. No. 537,087
Int. Cl.² H01R *13/58*
U.S. Cl. 339—103 R **14 Claims**



1. A hood assembly for an electrical connector which supports a plurality of contacts, which connector has a front portion and a rear portion, and which electrically taps at said contacts a plurality of conductors which are received in a bundle and exit the connector individually, said hood assembly comprising:

a hollow housing including means defining a first opening and means for mounting the connector in said housing with the front portion of said connector extending through the first opening;

means defining a second opening for receiving the bundle of conductors, including means for clamping the bundle of conductors in the second opening; and

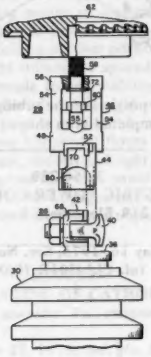
means defining a narrow slot for receiving the individual conductors therethrough and distributing the same in a generally side-by-side relationship.

3,966,294

ADAPTOR FOR TRANSFORMER BUSHING TERMINALS

Ronald E. Benton, Athens, Ga., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 5, 1973, Ser. No. 337,968
Int. Cl.² H01R *15/18*
U.S. Cl. 339—153 **9 Claims**



1. An adaptor suitable for attachment to the terminal of an electrical bushing, said adaptor comprising:

a form-fitting skirt dimensioned to fit tightly around a substantial portion of the bushing terminal;

a stud dimensioned to extend into clamping means on the bushing terminal;

an adaptor base attached to said skirt and stud;

an adaptor crown having a threaded opening therein;

a plurality of supporting columns having two ends, with one end of said columns attached to said base and the other end of said columns attached to said crown, said columns being separated sufficiently to permit the insertion of an electrical cable between two of said columns;

a shoe disposed between said base and crown and guided within a channel formed by said columns; and

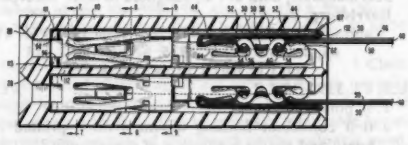
tightening means threadably engaged with the threaded opening in said crown, said tightening means being attached to said shoe in such a manner that rotation of said tightening means moves said shoe toward said base.

3,966,295

TERMINATING APPARATUS FOR FLAT CONDUCTOR CABLES

Anthony Joseph Hyland, Delran, N.J., and Wade William Crossley, Bristol, Pa., assignors to Elco Corporation, Willow Grove, Pa.

Filed June 17, 1974, Ser. No. 480,314
Int. Cl.² H01R *13/50, 9/16*
U.S. Cl. 339—176 MF **4 Claims**



1. Contact apparatus for conductor means comprising:

contact tail means for simultaneously providing a secure structural and electrical connection to an associated conductor;

contact nose means for providing a releasable electrical connection to another associated mating conductor contact means; and

bridge means for connecting said contact tail means with the contact nose means to provide a unitary contact apparatus, wherein said contact nose means includes

a pair of opposed contact tines resiliently cantilevered from said bridge means in a direction away from said contact tail means, said tines being mutually self-biased together at the free end thereof for providing said releasable electrical connection with the another associated mating conductor contact means,

wall means longitudinally extending from said bridge means along at least one side of said pair of opposed contact tines in a posture contiguous to but spaced from said pair of opposed contact tines, and

lance means formed by a portion of said at least one wall means and resiliently cantilevered to one side of said contact away from said pair of opposed contact tines, said lance means being oriented in the general direction of said contact tail means, said lance means being operable to resiliently engage a correspondingly locking recess fashioned within an insulator housing for selectively retaining said contact apparatus within an insulator housing,

said bridge means including:

a pair of spaced, parallel legs extending transversely relative to said wall means to another side of said contact other than the side to which said lance means is cantilevered, one of said legs being dimensioned differently than the other for being operably received within a correspondingly dimensioned recess fashioned within an insulator housing to permit insertion of the contact apparatus within an insulator housing only in accordance with a predetermined orientation;

said opposed contact tines being integral with respective ones of said legs and projecting therefrom in a direction away from said contact tail means.

4. Electrical connector apparatus comprising:

a generally flat conductor cable having a plurality of coplanar individual conductors,

a generally rectangular insulation housing means having

a forward portion carrying an array of longitudinally extending apertures with mutually parallel and coplanar axes, and

a generally open rearward portion communicating with said apertures;

a plurality of contact means for each housing aperture, each including

contact tail means disposed in said housing rearward portion and simultaneously providing a resilient structural and electrical connection to an associated one of said plurality of cable conductors,

said tail means being secured to said cable at a location remote from the terminal end of said cable, with a terminal end section of said cable being folded over upon itself opposite said tail means in said housing rearward portion;

contact nose means disposed within an associated housing aperture for providing a releasable electrical connection to another associated one of a plurality of mating conductor contacts, and

bridge means for connecting said contact tail means with said contact nose means to provide a unitary contact apparatus;

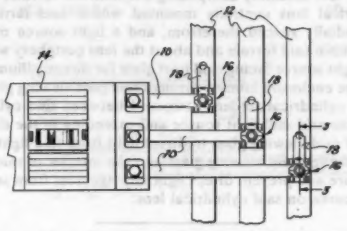
said housing rearward portion further including a plurality of ridge means projecting in a direction generally perpendicular to the plane of said cable and being in engagement with said folded cable section to depress said folded cable section against the connection between said tail means and said cable conductors to enhance said resilient connection therebetween.

3,966,296

ANTI-TURN CLIP FOR INCORPORATION IN BOLTED ELECTRICAL JOINTS

Eric A. Ericson, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jan. 25, 1974, Ser. No. 436,696
Int. Cl.[2] H01R 7/08
U.S. Cl. 339—263 R 12 Claims



10. For use with a bolted electrical joint between rigid first and second current carrying members having rectangular cross-sections, a clip for maintaining a predetermined angular relationship between the members despite looseness of the bolt securing the joint, said clip comprising:

A. an elongated body;

B. means forming an aperture in said body adjacent one end thereof to accommodate passage of the bolt used to make the bolted joint;

C. a pair of spaced arms extending laterally from said body adjacent said aperture, said arms adapted for disposal in contiguous relation to opposed lateral surface portions of the first member;

D. means deforming the portion of said body surrounding said aperture into a depression such that, when said clip is incorporated in an electrical joint, the bolt clamping pressure acts to flatten out said deformed body portion and thereby reduce the spacing between said arms so as to bring said arms into engaging relation with the opposed lateral surface portions of the first member; and

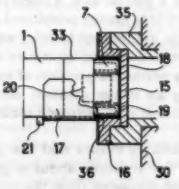
E. means carried by said body at the other end thereof for engaging the second member.

3,966,297

DEVICE FOR OBSERVING AN EQUIPMENT UNDER TENSION

Jacques Vigreux, and André Gromier, both of Lyon, France, assignors to Delle-Alsthom, Villeurbanne, France

Filed May 28, 1974, Ser. No. 473,978
Claims priority, application France, June 1, 1973, 73.20100
Int. Cl.[2] G02B 23/08
U.S. Cl. 350—52 1 Claim



1. In an optical observation device for viewing the condition of high voltage equipment within an opaque electrical apparatus enclosure through a cylindrical viewing port within the enclosure wall covered by a viewing glass, and forming an

annular recess outwardly of said viewing glass, said device comprising:

a periscope terminating at one end in a tubular lens assembly, the improvement comprising:

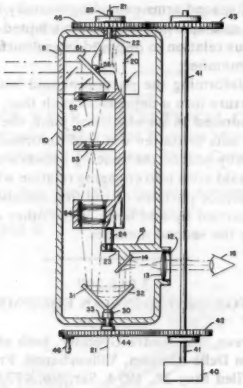
periscope support means comprising an annular securing element received within said recess of said enclosure wall port and having a trough extending outwardly therefrom for supporting said tubular lens assembly in axial alignment and juxtaposed to said viewing port glass, and

said lens assembly comprising a cylindrical ferrule, a cylindrical lens centrally mounted within said ferrule and radially spaced therefrom, and a light source mounted within said ferrule and about the lens periphery with said light source facing said port glass for directly illuminating the enclosure interior through said port viewing glass, and a cylindrical screen interposed between said cylindrical lens and said light source and extending in the direction of said viewing glass to direct light from said light source through said viewing glass into the interior of said enclosure and prevent direct light impingement from said light source on said cylindrical lens.

3,966,298
IMAGE DEROTATION DEVICE FOR RELAYING OPTICAL PATHS OFF OR ACROSS GIMBALS

Arthur S. Chapman, Rolling Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 6, 1974, Ser. No. 530,335
Int. Cl.² G02B 23/02
U.S. Cl. 350—23 **10 Claims**



1. In an optical system of the type having a first gimballed portion of the system including objective lens means mounted for rotation about a gimbal axis, a fixed portion of the system including eyepiece lens means positioned in fixed relationship to said gimbal axis, and means to relay an optical image from said gimballed portion of said system to said fixed portion of said system in any permitted position of said gimballed portion without incurring an image rotation about the line of sight along the optic axis of said eyepiece means, the improvement comprising:

a. means to rotatably mount said first gimballed portion of said system for rotation about a gimbal axis which is parallel to and displaced from the optic axis of said objective lens means of said first gimballed portion in any position thereof so that said optic axis describes an arc of constant radius about said gimbal axis during rotation of said gimballed portion;

b. a second gimballed portion comprising optical path folding means mounted for rotation about a projection of said gimbal axis independently of said first gimballed portion and positioned to receive an image from said objective lens means which is directed therefrom in a path along said optic thereof and to fold said path so that it emerges in a direction parallel and opposed to the direction of said optical path along said optic axis of said first gimballed portion of said system and displaced therefrom, the optical path length through said optical path folding means being the same in any position of said path folding means for any point on said image;

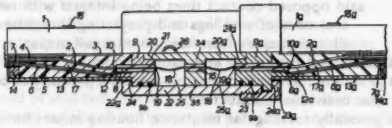
c. image receiving means positioned on said fixed portion of said system in fixed relationship to said gimbal axis for receiving said image along said folded path from said folding means and for transmitting it through said eyepiece means; and

d. means to simultaneously rotate said first gimballed portion including said objective lens of said system and said second gimballed portion including said optical path folding means at different but proportional rates such that said folding means rotates at an angular rate equal to one-half of the angular rate of rotation of said objective lens of said system.

3,966,299
COMMUNICATION CABLES

John Richard Osterfield, and Robert George Pragnell, both of Eastleigh, England, assignors to Pirelli General Cable Works Limited, London, England

Filed Mar. 19, 1975, Ser. No. 559,883
Claims priority, application United Kingdom, Mar. 20, 1974, 12467/74
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 C **11 Claims**



1. A communications cable system comprising:

a. a plurality of communications cables joined end-to-end, each said communications cable comprising:

i. a plurality of single-material optical fibres extending the length of the respective cable; and

ii. a plurality of short lengths of cladded-core optical fibres at each end of the respective cable, said single-material optical fibres being optically joined at their opposite ends to respective ends of respective said short cladded-core optical fibres; and

b. a plurality of cable joining means, each joining the ends of an adjacent pair of said cables, each said means being provided with a plurality of through-bores extending between the pair of cables joined thereby, the free ends of the short cladded-core optical fibres of the two cables being inserted into opposite ends of respective said through-bores.

3,966,300
LIGHT CONDUCTING FIBERS OF QUARTZ GLASS

Gerhard Bernsee, Mainz-Weisenau, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed Jan. 22, 1973, Ser. No. 325,377
Claims priority, application Germany, Jan. 24, 1972, 2203140
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 B **15 Claims**

1. A light-conducting optical fiber comprising a quartz glass core consisting of SiO_2, 0–20 ppm H_2O, and up to 1 ppm trace

elements, and having a refractive index N_1, encased by a quartz glass sheath consisting of SiO_2, 800–4000 ppm H_2O,

and up to 1 ppm trace elements, and having a refractive index N_2, N_1 being greater than N_2.

3,966,301

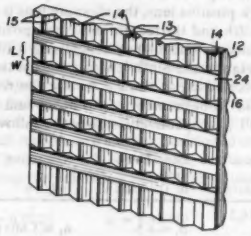
TRANSPARENT SCREEN HAVING INTERMITTENT PORTIONS FOR REDUCING REFLECTION FROM AMBIENT LIGHT

John W. Brown, Flemington, N.J., assignor to Qantix Corporation, Flemington, N.J.

Continuation-in-part of Ser. No. 534,297, Dec. 19, 1974, abandoned. This application Oct. 16, 1975, Ser. No. 622,896

Int. Cl.² G03B *21/60*

U.S. Cl. 350—128 **17 Claims**



1. A front projection screen made from a sheet of light-transmitting material having a predetermined critical angle of internal reflection less than 45°; said sheet having a front surface and a back surface; said screen being characterized by:

a plurality of parallel ridges formed on said front surface, each forming a section of a cylinder having a predetermined focal length;

a plurality of parallel ridges formed on said back surface, each having curved sides terminating at a peak; said curved sides extending away from said sheet at an angle equal to or greater than 45° immediately adjacent to said sheet; the angle between a line tangent to said sides and said sheet continuously decreasing as said curved sides extend toward said peak; the angle between a line tangent to said sides and said sheet being greater than or equal to said predetermined critical angle of internal reflection at said peaks but less than 45°;

said ridges on said front surface being disposed perpendicularly to said ridges on said back surface; and

means on said back surface formed parallel to said ridges on said front surface for intermittently interrupting said parallel ridges on said back surface so that light incident upon said means is not reflected therefrom.

3,966,302

PANEL FOR LIQUID CRYSTAL DISPLAY AND METHOD OF MAKING

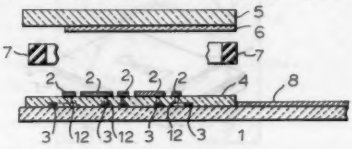
Masanari Mikoda, Neyagawa; Hisashi Akatani, and Shigeru Hayakawa, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 16, 1974, Ser. No. 515,359

Claims priority, application Japan, Oct. 19, 1973, 48-118196

Int. Cl.² G02F *1/16*

U.S. Cl. 350—160 LC **10 Claims**



1. A panel for a liquid crystal display device, comprising: a ceramic substrate; lead conductors on one surface of said ceramic substrate; an insulating glass layer on said ceramic substrate and covering said lead conductors, said glass layer having electrical conductors therein which are spaced from each other and are electrically connected to the respective lead conductors and extend through the thickness of said glass layer; rear segment electrodes on the surface of said glass layer opposite to the surface of said glass layer facing said ceramic substrate and in a pattern to form the desired display; a spacer on said substrate around said rear segment electrodes; and a transparent glass plate having transparent front electrodes on one surface thereof on said spacer with said front electrodes facing said rear segment electrodes and spaced therefrom, the space between said glass layer and said glass plate and within said spacer being adapted to be filled with a liquid crystal, said front and rear segment electrodes being for exciting the liquid crystal.

3,966,303

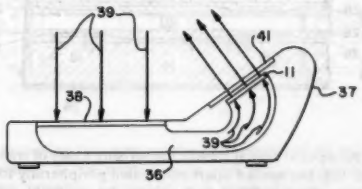
LIQUID CRYSTAL DISPLAY UTILIZING TRANSMITTED LIGHT

Mititaka Yamamoto, Los Altos, Calif., assignor to Omron Tateisi Electronics Co., Mountain View, Calif.

Filed July 26, 1974, Ser. No. 492,152

Int. Cl.² G02F *1/13*

U.S. Cl. 350—160 LC **2 Claims**



1. In combination with a liquid crystal display for use in a light transmitting mode, a case for mounting the liquid crystal display, at least one fiber optics bundle positioned in said case having one end exposed to ambient light and the other end in juxtaposition with the reverse side of the liquid crystal display for collecting ambient light at said one end and for concentrating and directing the ambient light on the reverse side of the liquid crystal display, said fiber optics having a larger cross sectional area at said one end then at said other end, whereby light flux density at the reverse side of the liquid crystal display is higher than ambient, thereby passing through the display for

providing sufficiently high light contrast ratios to allow visual interpretation in relatively low ambient light conditions.

3,966,304

LIQUID CRYSTAL DISPLAY DEVICE

Teruyuki Kakeda, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Aug. 14, 1974, Ser. No. 497,266

Claims priority, application Japan, Aug. 20, 1973, 48-97396[U]

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC **10 Claims**

1. A liquid crystal display device comprising a liquid crystal contained in a cell comprising transparent, opposed, spaced-apart, parallel, multi-layered side walls, wherein the side walls comprise:

a. a transparent outer base plate;

b. a transparent intermediate electrode layer; and

c. a transparent interior polymeric film in abutting relationship to a surface of the liquid crystal, the long axes of the constituent molecules of selected portions of the transparent interior polymeric film having select orientations different from the orientations of the molecules of the remainder of the transparent interior polymeric film, the long axes of the molecules in the liquid crystal having orientations corresponding to the orientations of the constituent molecules of the interior film.

3,966,305

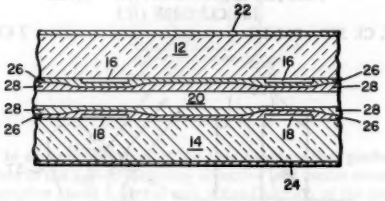
LIQUID CRYSTAL CELL WITH IMPROVED ALIGNMENT

Robert A. Young, San Jose, Calif., assignor to American Micro-Systems, Inc., Santa Clara, Calif.

Filed Oct. 10, 1974, Ser. No. 513,580

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC **4 Claims**



1. An optical display device comprising a pair of transparent plates that are spaced apart and sealed peripherally to form a thin planar cavity filled with a twisted nematic liquid crystal material;

a first layer of transparent conductive material forming an electrode in a preselected pattern configuration on the inner surface of each said plate;

a first thin film of dielectric material covering the inner surface and said conductive pattern configuration on each said plate said first film having substantially the same thickness over the entire conductive pattern and forming a second layer having a surface that is more uniform in chemical composition and texture than said inner surface of the plate and its said first layer of conductive material thereon;

and a second thin film of aligning material of uniform thickness covering said second layer on each said plate and causing the molecules of said liquid crystal material to be aligned essentially parallel to each other on the surface of each plate.

3,966,306

LARGE APERTURE SUPER WIDE ANGLE LENS

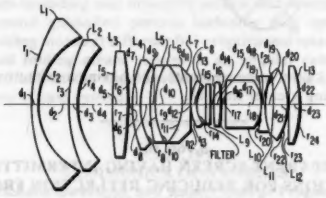
Sadao Okudaira, Ranzan, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1975, Ser. No. 547,684

Claims priority, application Japan, Feb. 28, 1974, 49-23851

Int. Cl.² G02B 9/64, 5/20

U.S. Cl. 350—214 **2 Claims**



1. A super wide angle lens comprising 13 lenses grouped in 11 components wherein the first and second lenses are negative meniscus lenses convex to the object, the third lens is a positive lens, the fourth lens is a negative meniscus lens convex to the object, the fifth, sixth and seventh lenses constitute a cemented triplet, the eighth lens is a negative meniscus lens convex to the object, the ninth lens is a positive lens, the tenth lens is a thick positive lens, the eleventh lens is a negative lens, and the twelfth and thirteenth lenses are positive lenses convex to the image, and further comprising a filter located between said eighth and ninth lenses, wherein the radii r_1 to r_{24}, the thickness and separations d_1 to d_{23}, the refractive indices n_1 to n_{13}, and Abbe numbers ν_1 to ν_{13} of said first to thirteen lenses L_1 to L_{13}, respectively, satisfy the following conditions:

Lens	Radius of Curvature r	Lens Thickness or or Distance d	Refractive Index n	Abbe No. ν
	r_1 = 256.3			
L_1		d_1 = 6.5	n_1 = 1.6031	ν_1 = 60.7
	r_2 = 121.6	d_2 = 47.4		
	r_3 = 253.9			
L_2		d_3 = 14.1	n_2 = 1.7410	ν_2 = 52.7
	r_4 = 125.8			
		d_4 = 57.4		
	r_5 = 783.8			
L_3		d_5 = 22.9	n_3 = 1.6258	ν_3 = 35.7
	r_6 = −430.9			
		d_6 = 6.1		
	r_7 = 211.3			
L_4		d_7 = 9.3	n_4 = 1.8160	ν_4 = 46.8
	r_8 = 119.7			
		d_8 = 16.4		
	r_9 = 277.8			
L_5		d_9 = 8.1	n_5 = 1.5473	ν_5 = 53.6
	r_{10} = 119.3			
L_6		d_{10} = 43.2	n_6 = 1.7200	ν_6 = 50.3
	r_{11} = −100.4			
L_7		d_{11} = 12.6	n_7 = 1.5613	ν_7 = 45.2
	r_{12} = 5113.5			
		d_{12} = 0.5		
	r_{13} = 89.6			
L_8		d_{13} = 8.1	n_8 = 1.6968	ν_8 = 56.5
	r_{14} = 47.6			
		d_{14} = 20.5		
	r_{15} = 455.8	filter thickness 4.3		
		d_{15} = 10.3	n_9 = 1.8051	ν_9 = 25.4
L_9	r_{16} = −249.8			
		d_{16} = 9.9		
	r_{17} = −834.6			
L_{10}		d_{17} = 57.2	n_{10} = 1.4645	ν_{10} = 66.0
	r_{18} = −66.9			
		d_{18} = 0.5		

—Continued

Lens	Radius of Curvature r	Lens Thickness or Distance d	Refractive Index n	Abbe No. ν
	$r_9 = -201.9$			
L_{11}		$d_{19} = 5.4$	$n_{11} = 1.8051$	$\nu_{11} = 25.4$
	$r_{20} = 157.9$			
		$d_{20} = 11.1$		
	$r_{21} = -1167.6$			
L_{12}		$d_{21} = 25.5$	$n_{12} = 1.4645$	$\nu_{12} = 66.0$
	$r_{22} = -95.6$			
	$d_{22} = 0.5$			
	$r_{23} = 10629.3$			
L_{13}		$d_{23} = 18.9$	$n_{13} = 1.6204$	$\nu_{13} = 60.3$
	$r_{24} = -209.0$			

3,966,307
TELEPHOTO LENS SYSTEM

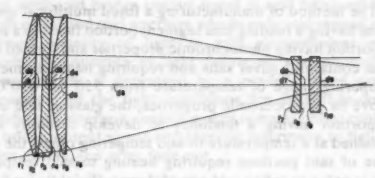
Tsutomu Tojyo, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1974, Ser. No. 516,015

Claims priority, application Japan, Oct. 23, 1973, 48-118527

Int. Cl.² G02B 9/60

U.S. Cl. 350—216 **2 Claims**



1. A telephoto lens system comprising five lenses, a first lens being a positive meniscus lens with its convex surface positioned on the object side, a second lens being a biconcave lens, a third lens being a positive meniscus lens with its convex surface positioned on the object side, a fourth lens being a negative lens with its concave surface positioned on the object side, and a fifth lens being a biconvex lens, and said telephoto lens system having the following numerical values:

$r_1 = 0.3186$			
	$d_1 = 0.0225$	$n_1 = 1.48749$	$\nu_1 = 70.1$
$r_2 = 2.8394$			
	$d_2 = 0.0112$		
$r_3 = -0.9987$			
	$d_3 = 0.0110$	$n_2 = 1.7400$	$\nu_2 = 31.7$
$r_4 = 1.2312$			
	$d_4 = 0.0020$		
$r_5 = 0.3283$			
	$d_5 = 0.0230$	$n_3 = 1.52542$	$\nu_3 = 64.5$
$r_6 = \infty$			
	$d_6 = 0.3649$		
$r_7 = -0.1408$			
	$d_7 = 0.0100$	$n_4 = 1.51874$	$\nu_4 = 64.5$
$r_8 = \infty$			
	$d_8 = 0.0140$		
$r_9 = 0.6388$			
	$d_9 = 0.0200$	$n_5 = 1.57309$	$\nu_5 = 42.6$
$r_{10} = -0.4795$			
$f = 1.0$	$f_B = 0.3413$	$P = 0.82$	
$1 : 4.5$			

wherein reference symbol r_1 through r_{10} respectively represent radii of curvature of respective lens surfaces, reference symbols d_1 through d_9 respectively represent thicknesses of respective lenses and airspaces between respective lenses, reference symbols n_1 through n_5 respectively represent refractive indexes of respective lenses, reference symbols ν_1 through ν_5 respectively represent Abbe's numbers of respective lenses, reference symbol f represents the focal length of the lens system as a whole, reference symbol f_B represents the back focal length, and reference symbol P represents the telephoto ratio.

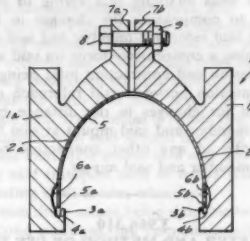
3,966,308
DEVICE FOR REFLECTING RADIANT ENERGY

Hans Erik Nilson, Vargon, Sweden, assignor to Infrarodteknik AB, Vanersborg, Sweden

Filed May 1, 1974, Ser. No. 466,035

Int. Cl.² G02B 5/10

U.S. Cl. 350—293 **11 Claims**



1. A device for reflecting energy comprising, in combination, two substantially mirror-symmetrical housing sections, each having a curved supporting surface which forms with the supporting surface of the other housing section a substantially continuous support surface defining a cavity having an open end when said housing sections are assembled to constitute a housing; at least one portion in each housing section at said open end and projecting into said cavity of said housing and provided with at least one recess; a reflecting element in said housing in abutment and substantial conformity with said supporting surfaces and having at least one marginal portion; and means for drawing said housing sections towards one another so that said marginal portion of said reflecting element enters said recess of said housing sections during the drawing of the latter together to constitute said housing, and is retained in said recesses of said housing whereby said reflecting element is connected to said housing.

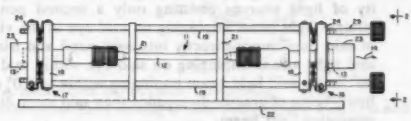
3,966,309
ADJUSTABLE MOUNTING STRUCTURE FOR OPTICAL DEVICE

Galen E. Mohler, Mountain View, Calif., assignor to Lexel Corporation, Palo Alto, Calif.

Division of Ser. No. 392,614, Aug. 20, 1973, Pat. No. 3,864,029. This application Nov. 25, 1974, Ser. No. 526,506

Int. Cl.² G02B 5/08

U.S. Cl. 350—310 **10 Claims**



1. A mounting structure enabling adjustment of the position of an optical device relative to an optical axis comprising a reference member positioned at a predetermined location relative to said optical axis, a mount for said optical device, and means connecting said mount to said reference member for adjustment of the position of said mount with respect to said reference member, said connecting means including:

A. a first connection between said reference member and said mount at a first location, said first connection having:

1. a separator which extends between said reference member and said mount at said first location for maintaining the same spaced apart thereat, the length of said separator along a path extending directly between said reference member and said mount at said first location being selectively variable; and

2. a leaf spring having opposite ends respectively secured independently of said separator to said reference member and said mount and being in tension therebetween to resiliently urge said reference member and said mount toward one another at said first location by maintaining a compressive force on said separator, said leaf spring being characterized by including an expansion and contraction joint under tension between said opposite ends enabling said spring to lengthen and shorten to compensate for changes in the distance between said reference member and said mount while maintaining a compressive force on said separator;

B. said expansion and contraction joint being free of any other connection between said reference member and said mount for changes in the distance between said reference member and said mount at said first location independently of any other connection between said reference member and said mount.

3,966,310

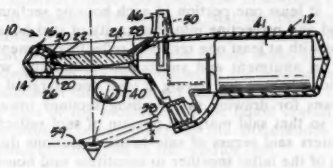
PUPILLOMETER AND METHOD OF USE THEREOF

Merlin D. Larson, 3420 21st St., San Francisco, Calif. 94110

Filed Feb. 15, 1974, Ser. No. 442,760

Int. Cl.² A61B 3/10

U.S. Cl. 351—16 **2 Claims**



1. Hand-operable apparatus for observing reaction of the iris in the pupil of an eye, comprising:

a body sized to be hand-held;

a plurality of generally unidirectional light sources mounted on said body and positioned to direct light therefrom to said eye in the area of said pupil upon hand-positioning of said body, at least one light source emitting only a first generally straight light beam impinging on said eye generally along a line within the limits of from 0° to 20° from a plane tangent to the center of the pupil, and at least one other generally unidirectional light source of said plurality of light sources emitting only a second generally straight light beam impinging on said eye in the vicinity of said pupil more directly into said pupil and iris than said light means impinging on said eye within said 0° to 20° limits, said light beam impinging within said 0° to 20° limits being of greater divergence than said more directly impinging light beam;

means for selectively actuating the light source impinging more directly on the pupil;

lens means mounted on said body and positioned for allowing observation therethrough of the reaction of the iris and pupil to the selectively actuated light source impinging more directly on the pupil;

marking means mounted on said lens means and sized in relation to said lens means and the distance of the pupil therefrom to indicate the size of the pupil being observed;

said means for selectively actuating the light source comprising pressure-sensitive switch means mounted on said body and positioned between adjacent fingers of the hand with the body so hand-held, said pressure-sensitive switch means actuating said light source upon application of pressure applied thereto by one adjacent finger in the direction of the other adjacent finger.

3,966,311

METHOD OF PRODUCING PHOTOCHROMIC MULTIFOCAL SPECTACLE LENSES

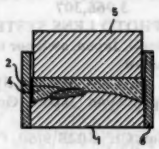
Siegfried Korn, Oberkochen; Bernd Kratzer, Huttlingen, and Otto Muckenhaupt, Oberkochen, all of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Germany

Continuation of Ser. No. 355,865, April 30, 1973, abandoned. This application Jan. 22, 1975, Ser. No. 543,083

Claims priority, application Germany, May 2, 1972, 2221488

Int. Cl.² G02B 1/10; C03B 11/08

U.S. Cl. 351—164 **21 Claims**



1. The method of manufacturing a fused multifocal spectacle lens having a reading lens segment portion fused to a major lens portion having photochromic properties and formed from a glass containing silver salts and requiring heat treatment in a tempering range of temperature from 550° to 650°C. to improve its photochromic properties, the glass of said major lens portion having a tendency to develop turbidity when maintained at a temperature in said tempering range, the glass of one of said portions requiring heating to said tempering range in order to soften said one of them sufficiently for fusion of the two glasses to each other, said method comprising the steps of heating both of said lens portions, at least said major portion being heated to a temperature in said tempering range, bringing the two portions into fusion position relative to each other at a time not later than a time when said major portion is at a temperature in said tempering range, maintaining said major portion at a temperature in said tempering range only sufficiently long to improve the desired photochromic properties and to accomplish fusion of the two portions to each other, and then cooling the fused portions relatively rapidly to a temperature below said tempering range at such rate that the total time in said tempering range is not more than about 10 hours.

19. The product of the process of claim 1.

3,966,312

FADE-OVER ARRANGEMENT FOR A MOTION PICTURE CAMERA

Eduard Wagensonner, Aschheim, and Volkmar Stenzenberger, Unterhachung, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Dec. 5, 1974, Ser. No. 530,044

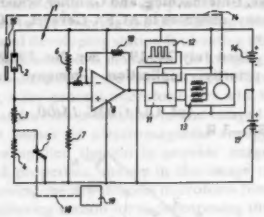
Claims priority, application Germany, Dec. 15, 1973, 2362506

Int. Cl.² G03B 21/36

U.S. Cl. 352—91 C **4 Claims**

1. In a motion picture camera having film and a diaphragm having a variable aperture positioned in the path of light to said film, a fade-over arrangement, comprising, in combination, bridge circuit means having a first arm including photoelectric receiver means positioned following said diaphragm in said path of light to said film for creating a first electrical impedance varying as a function of light impinging thereon, a second arm including a second impedance, and a bridge output terminal for furnishing a bridge output signal varying as a function of both said first and second impedances, said bridge output signal being a balanced bridge output signal when a predetermined relationship exists between said first and second impedances; fade-out switch means connected to said

second impedance for changing the value thereof upon external activation from a first predetermined value to a second predetermined value and in a direction for changing the quantity of light required for furnishing said balanced bridge output signal from a first predetermined quantity to a second predetermined quantity substantially less than said first predetermined quantity but exceeding zero; and aperture control means connected to said bridge output terminal for decreasing the size of said aperture under control of said bridge output



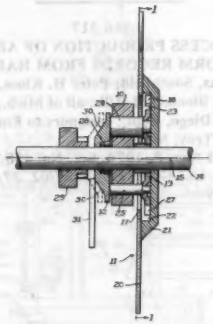
signal until said bridge output signal is said balanced bridge output signal and said aperture admits only said second predetermined quantity of light to said photoreceiver means, whereby the quantity of light falling on said photoelectric receiver means is decreased by a predetermined quantity independent of the light conditions for each fade-out and whereby said aperture control means remains under control of said bridge output signal and thereby responsive to light conditions during and after fade-out.

3,966,313

FORWARD-REVERSE PROJECTOR MECHANISM

James G. Woodier, Morton Grove, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed July 2, 1975, Ser. No. 592,498
Int. Cl.² G03B *1/00*
U.S. Cl. 352—173 **11 Claims**



1. In a film feed apparatus for use in a motion picture projector and of the type which includes a shuttle which is driven by a film transporting cam disposed for engagement thereby, the shuttle having teeth for engaging perforations of a film to be transported and for transporting the film frames through a predetermined index stroke for bringing successive frames into registration with the projector aperture, and the transporting cam being mounted on and rotated in unison with a rotatable shaft, a forward-reverse film transport synchronizing mechanism which affords properly synchronized forward and reverse film transportation while maintaining rotating of the rotatable shaft in a single angular direction comprising:

a rotary shutter mounted in fixed axial and radial relation on the rotatable shaft with an axis of rotation concentric with the axis of rotation of the rotatable shaft and including a plurality of radially extending shutter blades, a given one of which is arranged for covering the aperture during both forward and reverse film transportation and additionally including first and second drive lugs arcuately spaced about said concentric axis by 180° and axially spaced along said concentric axes; and

transport cam drive means engaged with said transport cam and axially slideable between first and second positions on said rotating shaft, which cam drive means includes a driven lug positioned on said cam drive means so as to communicate with said first drive lug on said shutter when said cam drive means is in said first position and to communicate with said second drive lug on said shutter when said cam drive means is in said second position for causing said transport cam to rotate when said shutter and rotating shaft rotate; whereby

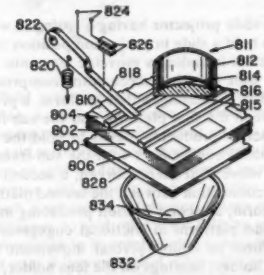
with said cam drive means being slideable between said first and second positions, the communication between said driven lug and said first and second drive lugs is selectable to thus alter the angular relationship between said transport cam and said shutter by 180° to cause the film feed mechanism to transport the film in both forward and reverse directions and to be properly synchronized for both forward and reverse film transportation.

3,966,314

MICROFORM CARD INCLUDING SURFACE LOCATING STRUCTURE FOR ELIMINATION OF NEWTON RING COLOR BANDING AND CARD UTILIZATION APPARATUS THEREFOR

George T. Brown, Jr., Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Division of Ser. No. 400,406, Sept. 24, 1973, Pat. No. 3,876,299. This application July 29, 1974, Ser. No. 492,642
Int. Cl.² G03B *23/08*; G02B *27/02*; G03B *27/28*
U.S. Cl. 353—27 R **6 Claims**



1. A microform card system comprising:

a microform card having a card body means with first and second opposed surfaces thereon;

said card body means having spaced image containing areas thereon and supporting areas between adjacent said image containing areas;

spacer means located on at least said second surface at said supporting areas and having a predetermined height at least equal to the combined length represented by several wavelengths of visible light and being spaced apart generally by a first separation distance;

a source of light adjacent said first surface for illuminating said image containing areas on said card and a moveable lens means adjacent said second surface for viewing said image containing areas;

positioning means for moving said microform card with reference to said lens means;

said lens means having a lens surface whose diameter is greater than said first separation distance so that when

said lens surface is moved into engagement with said card body at any location thereon to enable said lens surface engages at least two of said spacer means;

said spacer means being effective to maintain the lens surface of said lens means at said predetermined height away from said image containing areas when being viewed by said lens means to thereby eliminate the formation of Newton ring color band images.

3,966,315

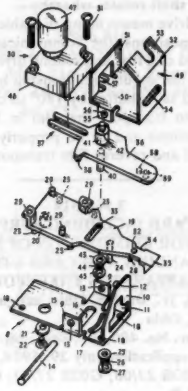
LENS FOCUSING MEANS FOR SLIDE PROJECTORS

Robert E. Styles, and John C. Les Veaux, both of Sydney, Australia, assignors to Hanimex Pty. Ltd., Australia

Division of Ser. No. 545,614, Jan. 30, 1975. This application Dec. 1, 1975, Ser. No. 636,592

Int. Cl. G02b *7/02;* **G03b** *3/00, 21/14*

U.S. Cl. 353—101 **5 Claims**



1. In a slide projector having a casing in which is mounted means to hold a slide in projection position in alignment with a lens system including a movable lens unit:

a lens unit focusing mechanism comprising a sub-frame fixed to the casing, a first platform, a pivotal connection between the first platform and the sub-frame;

first friction producing means to hold the first platform in frictional engagement with the sub-frame to inhibit pivotal movement therebetween, a second platform, a pivotal connection between the second platform and the first platform, a second friction producing means to hold the second platform in frictional engagement with the first platform to inhibit pivotal movement therebetween, a lens holder, bearings on the lens holder, a shaft in sliding engagement with the bearings, shaft holding means on the sub-frame in which said shaft is held, a slot in said second platform, a drive assembly fixed to the first platform, a peg on the drive assembly movable thereby in a circular path and engaging in the slot in the second platform, a first slot in the lens holder and a pivot pin on the second platform in engagement with the slot in the lens holder, a second slot in the lens holder parallel to the shaft and a peg on the sub-frame in engagement with the second slot;

manual pivoting movement of the first platform relative to the sub-frame being transferred through the pivot pin on the second platform to a side of the first slot in the lens holder to cause the lens holder to move along said shaft and said peg on the sub-frame to slide in the second slot in the lens holder, activation of the drive assembly causing pivotal movement of the second platform relative to the first platform by engagement of the driving assembly peg with a side of the slot in the second platform and the pivotal movement of the second platform being transferred through the pivot pin on the second platform to a side of the first slot in the lens holder to cause the lens holder to move along said shaft and said peg on the sub-frame to slide in the second slot in the lens holder.

3,966,316

ELECTROSTATIC COPYING MACHINE WITH REMOVABLE COPYING DRUM

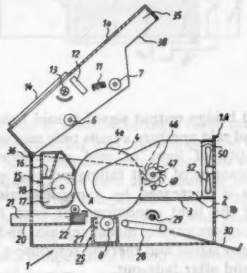
Josef Pfeifer, Unterhaching, and Gunther Schnall, Eching, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed July 24, 1975, Ser. No. 598,882

Claims priority, application Germany, July 27, 1974, 2436301

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 R **21 Claims**



1. In an electrostatic copying machine, a combination comprising a housing; centering means in said housing; a self-sustaining module removably mounted in said housing and including a casing, a mobile copying component installed in said casing; and means for cleaning said component, said cleaning means being mounted in said casing; said centering means engaging and locating said component and including at least one motion transmitting member actuatable to move said component with respect to said housing.

3,966,317

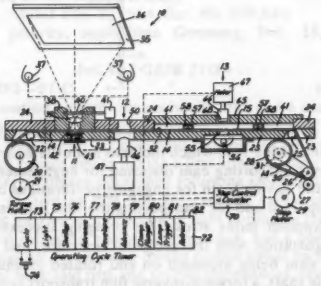
DRY PROCESS PRODUCTION OF ARCHIVAL MICROFORM RECORDS FROM HARD COPY

Harvey H. Wacks, Southfield; Peter H. Klose, Troy; Stanford R. Ovshinsky, Bloomfield Hills, all of Mich., and Robert W. Hallman, San Diego, Calif., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Apr. 8, 1974, Ser. No. 458,715

Int. Cl.² G03B *27/00, 27/02, 27/32*

U.S. Cl. 355—19 **18 Claims**



1. A dry-process apparatus for producing archival microform records from light reflecting hard copy comprising in

combination a dry-process mask film strip which is photosensitive to and imaged by light and dry developed by heat to provide imaged transparencies therein, an imaging and developing station, an image transferring station, means for moving the dry-process mask film strip to the imaging and developing station and to the image transferring station, means for applying light to the hard copy to be reflected thereby, means in the imaging and developing station for reducing the light image reflected from the hard copy to microimage size and applying the same to the dry-process mask film strip to produce microimages of the hard copy in the dry-process mask film strip when it is moved to the imaging and developing station, means in the imaging and developing station for heating the dry-process mask film strip when it is moved to the imaging and developing station for developing the microimages into microimage transparencies, a dry-process microform film which has archival properties and which is sensitive to and imaged and developed by short pulses of electromagnetic energy above a threshold value applied thereto to provide imaged records having archival properties, means in the image transferring station for receiving the dry-process microform film, means in the image transferring station for superimposing the dry-process microform film and the transparent microimaged dry-process mask film strip when it is moved to the image transferring station, and means in the image transferring station for applying short pulses of electromagnetic energy above a threshold value through the transparent microimaged dry-process mask film strip when it is moved to the image transferring station onto the dry-process microform film for providing in the dry-process microform film imaged microform records which conform to the transparent microimages in the dry-process mask film strip and which have archival properties.

3,966,318

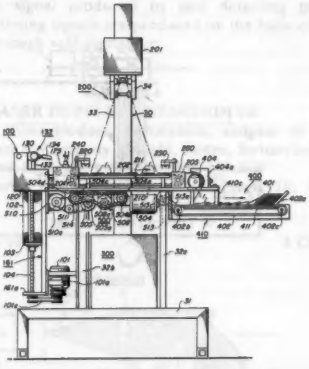
APPARATUS FOR AUTOMATIC MICROPHOTOGRAPHY

Andrew L. Amort, Ann Arbor, Mich., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 526,250, Nov. 22, 1974. This application Mar. 25, 1975, Ser. No. 561,968

Int. Cl.² G03B 27/32, 27/52

U.S. Cl. 355—64 **36 Claims**



1. An apparatus for photographing cards having a means for feeding cards successively from a stack of cards, said apparatus including:

a. means operative to feed individual cards from a stack of cards to a belt one at a time in response to a command signal, said means including;

means for picking up said cards;

linkage means for bringing said means for picking up cards adjacent the stack of cards to pick up a single card from the stack;

means for removing said card from said means for picking up cards;

belt means for accepting said cards from said removal means to hold and advance a predetermined number of cards for making photomicrographs of the cards held thereon;

delay means for adjustable delay of feeding of a subsequent card from said stack in order to form a space between successive cards on said belt;

stack elevation means for elevating said stack upon dimunition of the supply of cards in said stack below a predetermined level;

b. counting means for counting the number of cards fed to said belt;

c. means responsive to said counting means to stop the feeding means after a predetermined number of cards have been fed to said belt; and

d. means operative to advance said belt and reactivate said pick up means after a predetermined time interval.

3,966,319

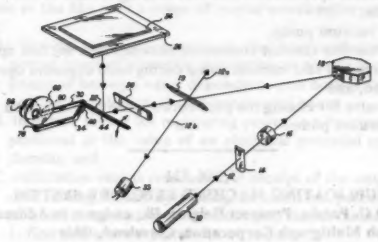
FLAT FIELD SCANNING MIRROR

John M. Lang, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 21, 1975, Ser. No. 570,300

Int. Cl.² G03B 27/70

U.S. Cl. 355—66 **17 Claims**

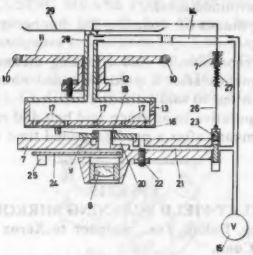


1. In a flat field scanning system having an illumination source generating a collimated beam, a stationary planar medium, a scanning mirror rotatable about an axis and interposed between said source and said medium and arranged to reflect said beam to said medium in successive increments in one direction across said medium during rotation thereof, a first cam follower, a second cam follower, means connecting said first cam follower to said mirror for shifting said mirror in a direction transverse to its rotational axis, means connecting said second cam follower to said mirror for pivoting the same about said rotational axis, a first cam, a second cam, the improvement comprising: a shaft, means for rotating said shaft in one direction, said cams being mounted on said shaft for rotation therewith, means urging said first cam follower into engagement with the surface of said first cam, means urging said second cam follower into engagement with the surface of said second cam, the surface of said first cam being so designed to effect shifting said mirror in one direction along a transverse path to the rotational axis thereof from a start-of-scan position to an intermediate scan position and to shift said mirror in the opposite direction from the intermediate scan position to an end-of-scan position and maintain a substantially constant length optical path from said source to said medium, the surface of said second cam being so designed to cause rotation of said mirror about its rotational axis in one direction during movement thereof from the start-of-scan position to the end-of-scan position in such a manner that said beam will be scanned at a substantially constant rate onto said medium.

3,966,320
MICROFILM CAMERA

Manfred Wiessner, Dresden, Germany, assignor to VEB Pentacon Dresden, Dresden, Germany

Filed Apr. 7, 1975, Ser. No. 565,961
Claims priority, application Germany, Apr. 10, 1974, 177798
Int. Cl.² G03B 27/60
U.S. Cl. 355—73 6 Claims

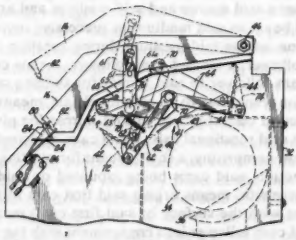


1. A microfilm camera comprising:
a. a film gate having a film bearing surface,
b. a suction plate for holding a sheet of film which can be moved in steps across the film gate,
c. suction apertures on said film bearing surface of said film gate,
d. a vacuum pump,
e. a suction conduit connected between said suction apertures and said vacuum pump during each exposure operation, and
f. a valve for closing the path between the apertures and the vacuum pump.

3,966,321
DUPLICATING MACHINE EXPOSURE SYSTEM

Robert C. Patzke, Prospect Heights, Ill., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed July 3, 1974, Ser. No. 485,346
Int. Cl.² G03B 27/04
U.S. Cl. 355—121 23 Claims

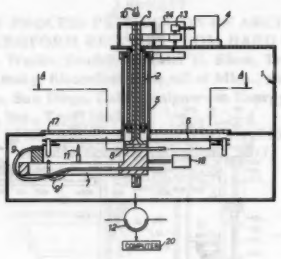


1. An exposure system comprising:
a light transparent platen;
a light source disposed on one side of said platen;
a shutter mechanism interposed between said light source and said transparent platen, said shutter mechanism having an open condition of operation for passing light from said light source to said platen and a closed condition of operation for blocking the passage of light from said light source to said platen;
a cover disposed on the opposite side of said platen, said cover having an open position for providing access to said platen and a closed position for covering said platen;
first resilient biasing means mechanically coupled to said cover for biasing said cover to a partially open position;
second resilient biasing means mechanically coupled to said shutter mechanism for biasing said shutter mechanism to said closed condition of operation;
linkage means mechanically coupling said shutter mechanism, said cover and said second resilient biasing means, said linkage means being responsive to the position of said cover for operating said shutter mechanism to the open condition of operation against the force of said second resilient biasing means when said cover is placed in the closed position, said linkage means including means for transmitting force from said second resilient biasing means to said shutter mechanism for operating said shutter mechanism to said closed condition of operation when said cover is biased to said partially open position by said first resilient biasing means;
timing means responsive to the closing of said cover for initiating a timing interval; and
means for latching said cover in the closed position against the force of said first resilient biasing means, said latching means being responsive to said timing means for releasing said cover upon the completion of said timing interval.

3,966,322
DEVICE FOR USE IN PRODUCING A SCANNING BEAM OF RADIATION AND APPARATUS FOR USE IN INVESTIGATING SPECIMENS

Geoffrey Stuart Greaves; Ian Deverill, and Roger Abraham Bunce, all of Birmingham, England, assignors to Vickers Limited, London, England

Filed Nov. 6, 1974, Ser. No. 521,254
Claims priority, application United Kingdom, Nov. 8, 1973, 51988/73; Oct. 28, 1974, 46608/74
Int. Cl.² G01N 33/16, 21/24
U.S. Cl. 356—39 24 Claims

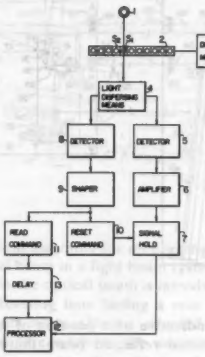


2. Apparatus for use in investigating liquid specimens, comprising a turntable having a rotational axis and adapted to support a plurality of at least partially light-transmitting vials or other vessels, each for containing a liquid specimen to be investigated, in a circular array centred on said axis, means for rotating the turntable stepwise about said axis, means for directing radiation, at least once during each dwell period of the turntable between successive stepwise advancements of the turntable, at each of the vessels in turn, and radiation receiving means arranged to receive radiation leaving the vessels.

3,966,323
APPARATUS FOR PRODUCING TIMING SIGNAL FOR PHOTOMETRIC MEASUREMENT

Yoshio Matsuoka; Hiroshi Inomata; Tsuneo Shimazaki, and Fujiya Takahata, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 18, 1974, Ser. No. 524,868
Claims priority, application Japan, Nov. 21, 1973, 48-130231
Int. Cl.² G01J 3/42
U.S. Cl. 356—96 **21 Claims**

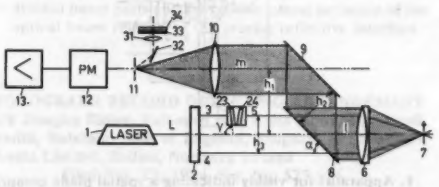


1. An apparatus for producing signals for timing the operations in photometric measurement comprising a light source, a plurality of containers for samples, driving means for providing a relative movement between said light source and said plurality of sample containers, means for detecting variation at least in a portion of light ransmitted through said sample container and for providing a detection signal in accordance therewith, said variation being caused by said relative movement, and means for deriving signals for timing the operations of measuring said samples contained in said container from the detection signal produced by said detecting means, whereby said timing signals are produced on the basis of light transmitted through said containers.

3,966,324
LASER DOPPLER ANEMOMETER

Paul D. Iten, Oberrohrdorf, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Mar. 22, 1974, Ser. No. 453,969
Claims priority, application Switzerland, Apr. 18, 1973, 5580/73
Int. Cl.² G01B 9/02
U.S. Cl. 356—106 R **5 Claims**

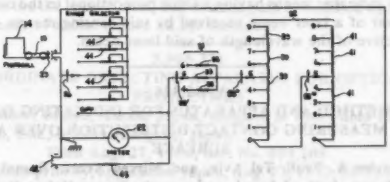


1. A laser Doppler anemometer comprising a source providing a laser radiation beam, means for splitting said laser radiation beam into a plurality of partial radiation beams, a common optical image-forming system for illuminating a measuring volume by said partial radiation beams and for receiving the backscattered signal radiation therefrom, a detector located in the optical path of said back-scattered signal radiation, and a deflecting device comprising at least one partially reflecting mirror means positioned in said common optical image-forming system for directing at least one part of the scattered signal radiation leaving said common optical image-forming system to a pinhole diaphragm, wherein said partially reflecting mirror means is constituted by two mirrors disposed plane parallel to each other and wherein said partially reflecting mirror means include light-transmissive elliptical rings.

3,966,325
LASER POWER METER

Galen E. Mohler, Mountain View, Calif., assignor to Lexel Corporation, Palo Alto, Calif.

Filed Mar. 31, 1975, Ser. No. 563,596
Int. Cl.² G01J 1/42
U.S. Cl. 356—218 **6 Claims**



1. A laser power meter for measuring the power of a laser beam or the like over a range of output wavelengths comprising:

A. sensing means responsive to the interception of the output beam of a laser by generating an electrical output potential having a value dependent upon both the power and the wavelength of said intercepted beam;

B. indicator means for registering power as a function proportional to the value of an electrical potential applied thereto; and

C. calibration means responsive to receipt of the output of said sensing means by passing an electrical potential to said indicator means; said calibration means including:

1. first and second pluralities of resistors;

a. said first plurality of resistors being selected to provide first resistance values between said sensing means and said indicator means, each of which resistance values responds to the receipt by said sensing means of a laser beam having a wavelength at the starting point of a chosen one of correspondingly successive segments of said wavelength range by passing a potential to said indicator means having a value in the proximity of the potential value causing said indicator means to register the true power of a laser beam having a wavelength representative of said starting point;

b. said second plurality of resistors being divided into first and second sections respectively providing ten and unit decimal resistance value selection, said resistance values being related to successive wavelength measurement values in a straight line function having a slope which approximates the slope in all of said wavelength segments of the actual relationship of resistance values to wavelength measurement values which would cause said indicator means to register the true power of laser beams received by said sensing means having said wavelengths; and

c. said starting points of said successive wavelength segments provided by said first plurality of resistors being selected at changes in the hundreds unit of a measurement of wavelengths within said wavelength range, the relationship of successive resistance values provided by said first plurality of resistors being related non-linearly to corresponding wavelength measurement values;

2. first switching means for connecting between said sensing means and said indicator means one or more of the resistors of said first plurality of resistors to provide a selected one of said first resistance values defining a chosen one of said successive wavelength range segments; and
3. second switching means including first and second switches respectively associated with said first and second sections of resistors of said second plurality of resistors for also connecting between said sensing means and said indicator means resistors of said sections to select digitally the beam wavelength in the chosen one of said wavelength range segments to which said sensing means will respond by passing a potential to said indicator means having a value generally equal to the potential value causing a true registration by said indicator means of the power of said laser beam,

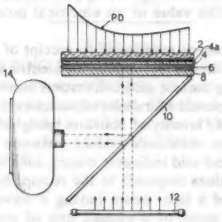
whereby said calibration means is adjustable on a decimal scale to pass an electrical potential from said sensing means to said indicator means having a value proportional to the output power of a laser beam received by said sensing means, irrespective of the wavelength of said laser beam.

3,966,326

METHOD AND APPARATUS FOR INDICATING OR MEASURING CONTACT DISTRIBUTION OVER A SURFACE

Maurice A. Brull, Tel Aviv, and Mircea Arcan, Ramat Hasharon, both of Israel, assignors to Ramot University Authority for Applied Research & Industrial Development Ltd., Tel Aviv, Israel

Filed Mar. 17, 1975, Ser. No. 559,240
Claims priority, application Israel, Mar. 29, 1974, 44525
Int. Cl.² G01B 11/18
U.S. Cl. 356—114 **15 Claims**



1. A method for indicating the contact pressure distribution over a surface, comprising the steps: transmitting the contact pressure to be indicated to a photoelastic member through a pressure-transmitting member having a plurality of point-contact projections effective to transmit said contact pressure to the photoelastic member in the form of a plurality of localized points, the photoelastic member being one whose optical properties are changed when the member is subjected to pressure; and optically displaying the changes in the optical properties of the photoelastic member.

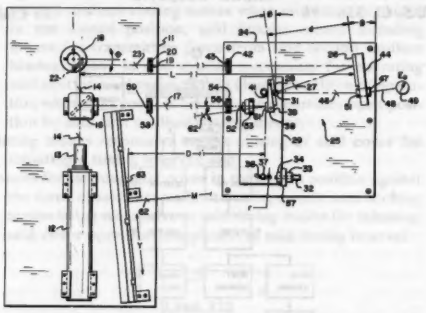
3,966,327

ANGULAR DISPLACEMENT MEASUREMENT APPARATUS

Richard Arthur Hanson, Concord, Calif., assignor to Systron Donner Corporation, Concord, Calif.

Filed Apr. 21, 1975, Ser. No. 569,839
Int. Cl.² G01B 11/26
U.S. Cl. 356—138 **13 Claims**

1. An angular displacement measurement apparatus for determining small angular motion of a device, comprising a main support frame, an optical table in predetermined spaced relation with said main support frame, a source of electromagnetic energy mounted on said main support frame, means for receiving said electromagnetic energy and for forming a beam for projection toward the device, means adapted to mount the device for receiving said beam and providing an initial reflected beam directed toward said optical table, means for intercepting said initial reflected beam and for amplifying the angular excursion thereof mounted on said optical table, said last named means including a beam position sensor producing



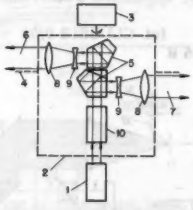
an output signal indicative of a position of impingement of said intercepted initial reflected beam thereon, means for adjusting the angular position of said means for amplifying thereby adjusting said position of impingement so that said output signal assumes a predetermined value, and means for indicating providing a measure of the angular motion of said means for amplifying in terms of the angular motion of said means adapted to mount the device.

3,966,328

DEVICE FOR GENERATING A SPATIAL REFERENCE PLANE

Klas Rudolf Wiklund, Taby, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Continuation of Ser. No. 512,235, Oct. 7, 1974, abandoned. This application Aug. 25, 1975, Ser. No. 607,257
Claims priority, application Sweden, Oct. 16, 1973, 7314028
Int. Cl.² G01B 11/26
U.S. Cl. 356—138 **9 Claims**

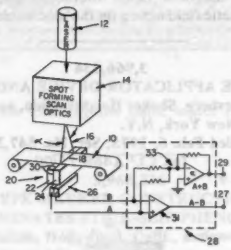


1. Apparatus for visibly indicating a spatial plane comprising a light emitter for generating a beam of light, means for dividing said beam of light into a first and second light beam directed in different directions in a first and second plane respectively, and means for scanning said first and second light beams in said first and second plane, respectively, said first and second planes being parallel to and on opposite sides of said spatial plane to be indicated.

3,966,329
PRECISION OPTICAL BEAM DIVIDER AND POSITION DETECTOR

Baron Christian Dickey, Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sept. 24, 1974, Ser. No. 508,918
Int. Cl.² G01B 11/26
U.S. Cl. 356—152 **10 Claims**



1. A split optical assembly for monitoring the lateral deviation of an optical beam in a light beam system from a selected position, wherein the optical beam is introduced to the assembly via a spot forming lens having a rear nodal plane, and wherein the beam scans along a selected scan path in the region of a recording medium, the assembly comprising the combination of;

single optical means formed of a split optical element for directly receiving the optical beam and for dividing the beam into at least two simultaneous beam parts within the same element, the split optical element defining confronting optical elements defining therebetween a line of intersection corresponding to the selected scan path, whereby the two simultaneous beam parts are formed as the optical beam scans along and is continuously divided by the intersection, said optical elements further having confronting surfaces wherein the line of intersection thereof defines a precise reflective interface with an optical accuracy of the order of 1/20 wave;

said split optical element including an optical surface to selectively image the rear nodal plane of the spot forming lens;

wherein any lateral deviation of the optical beam from the precise reflective interface correspondingly varies the relative sizes and thus the intensities of the two beam parts; and

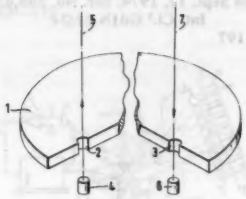
split transducer means including split diode photodetector means disposed to simultaneously receive respective beam parts and thus the images formed via the split optical element itself as the optical beam scans along the interface, to continuously generate a pair of selective output signals indicative of the relative intensities of the divided beam parts and thus of the lateral deviation of the optical beam relative to the precise reflective interface.

3,966,330
PHONOGRAPH RECORD DETECTING ARRANGEMENT

Keith Douglas Ridler, Fulbourn, and Colin Howard Stanwell-Smith, Balsham, both of England, assignors to Strathearn Audio Limited, Belfast, Northern Ireland

Filed Nov. 27, 1974, Ser. No. 527,636
Claims priority, application United Kingdom, Dec. 4, 1973, 56188/73; July 2, 1974, 29281/74; July 2, 1974, 29282/74
Int. Cl.² G11B 3/60, 17/04
U.S. Cl. 356—156 **12 Claims**

1. Apparatus for use in detecting the presence of a disc record on a turntable, including means comprising a source of energy and means for detecting the energy from said source, the arrangement being such that at least a part of a path for the energy set up between the source means and the detector means is in a region adjacent the surface of the turntable on

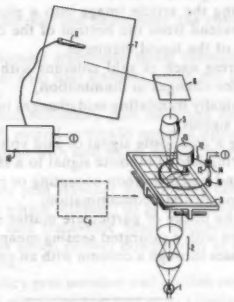


which the the record rests, and that the path is modified by the presence of a disc record on the turntable.

3,966,331
COORDINATE DETECTING APPARATUS FOR OPTICAL PROJECTORS

Masafumi Inuiya, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 27, 1974, Ser. No. 501,105
Claims priority, application Japan, Aug. 27, 1973, 48-95963
Int. Cl.² G01B 9/08
U.S. Cl. 356—164 **4 Claims**



1. A coordinate detecting apparatus for an optical projector, comprising:

a rotary code disc having thereon a clock pattern, a start line, a θ-pattern and an r-pattern, said clock pattern being provided about the periphery of said disc, said θ-pattern being a half line passing through the rotation center of said disc, said r-pattern including divergent curves passing through rotation center of said disc, the projections of said θ-pattern and said r-pattern being imposed on a picture image on a screen;

a rotating means for rotating said code disc;

a light pen adapted to be used in cooperation with the picture image screen to photoelectrically detect said projections of said θ-pattern and said r-pattern through said screen;

photoelectric means adjacent said code disc for detecting said clock pattern and said start line on the rotating code disc;

and

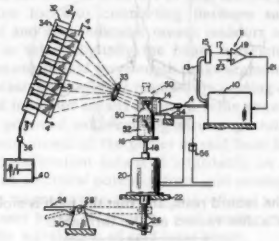
an electric circuit responsive to the outputs of said lightpen and said photoelectric means for counting the clock signal from said photoelectric means in response to the detected projections of said θ-pattern and said r-pattern to produce digital polar coordinate signals of the position of said lightpen with respect to the picture image on the screen.

3,966,332

METHOD AND APPARATUS FOR INSPECTING LIQUIDS IN TRANSPARENT CONTAINERS

Julius Z. Knapp, Somerset, and John C. Zeiss, Bloomfield, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Sept. 12, 1974, Ser. No. 505,431
Int. Cl.[2] G01N 21/24
U.S. Cl. 356—197 37 Claims



1. A method for inspecting a liquid-filled transparent container, that may have a multiplicity of specular reflections on or in itself, to detect foreign particles in the liquid, said method comprising the steps of:

a. placing the article at an inspection station,

b. rotating said liquid about an axis while holding said container stationary,

c. illuminating said article,

d. dissecting the article image into a plurality of columns which extend from the bottom of the container through the top of the liquid meniscus,

e. monitoring each of said columns with separate sensing means for changes in illumination,

f. electronically translating said changes in illumination into voltage signals,

g. forming a composite signal of said voltage signals,

h. comparing said composite signal to a standard reference signal and based thereon accepting or rejecting said article for particulate contamination;

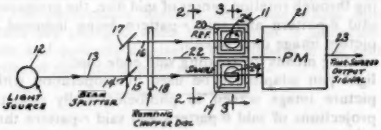
whereby the image of particulate matter which moves past a column with a saturated sensing means will be detected as it passes through a column with an unsaturated sensing means.

3,966,333

MAGNETIC STIRRER NOISE CANCELLATION SYSTEM

Byron E. Marcus, Columbia, Md., assignor to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Feb. 3, 1975, Ser. No. 546,676
Int. Cl.[2] G01J 1/10
U.S. Cl. 356—229 14 Claims



1. In an optical photometer device of the type employing a photosensitive electronic valve device, a sample cuvette, means to direct a light beam to the cuvette and to direct a resultant emergent beam to the electronic valve device, whereby to generate an electrical signal, and magnetic stirrer means including a movable stirrer magnet adjacent said cuvette and electronic valve device and a magnetic driven element in the cuvette, magnetic noise compensation means comprising a movable companion magnet adjacent said stirrer magnet and electronic valve device, means to support the magnetic so that they can be repetitively cyclically moved, the respective magnets having north and south poles, means intercoupling the magnets to move them synchronously in opposite senses, the magnets being mounted on the supporting means so that poles of opposite polarity of the respective magnets move alternately toward and away from each other as the magnets are cyclically moved in said opposite senses, and means to drive said stirrer magnet and companion magnet, whereby their magnetic fields interact in a manner to minimize the magnetic field acting on the electronic valve device.

3,966,334

ADHESIVE APPLICATOR DEVICE AND METHOD

Charles W. Forsberg, Shaker Heights, Ohio, assignor to Indian Head Inc., New York, N.Y.

Filed Feb. 6, 1975, Ser. No. 547,391
Int. Cl.[2] A46B 15/00
U.S. Cl. 401—9 12 Claims

1. An adhesive applicator device comprising:

an elongated shaft of x-shaped transverse section, said shaft including

a first elongated web having parallel side edges and having a plurality of spaced notches in each of said side edges, said notches each terminating in innermost portions positioned closer to one end of said shaft than is the opening to the respective notch;

a second elongated web intersecting said first web along the longitudinal axis of the shaft to form said x-shaped transverse section, said second web having parallel side edges;

a mounting plate secured to the opposite end of said shaft from said one end; and

a generally cylindrical porous, resilient applicator pad having an x-shaped slot therein along the central axis thereof and extending from one end of the pad over a major portion of the length thereof, said pad receiving said shaft in said slot and resiliently engaging said shaft.

3,966,335

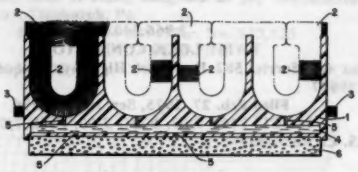
MULTI-DIGITAL SURGICAL SCRUB BRUSH

Daniel J. Abramson, 2800 Greenvale St., Chevy Chase, Md. 20015

Filed May 16, 1975, Ser. No. 578,009
Int. Cl.[2] A46B 11/00, 15/00
U.S. Cl. 401—10 12 Claims

1. A scrub brush comprising means for scrubbing all surfaces of the four fingers and web spaces simultaneously said means being in the form of four connected aligned finger length troughs which are bristle lined inwardly from all surfaces of the sides and bottoms, having fan shaped bristles projecting in all directions from the top of the trough walls so as to form an outer bristle surface as well as providing inwardly projecting bristles, intermeshing with the fan shaped bristles from the opposite trough wall to complete the bristle encirclement of each finger space, said intermeshed bristles being yieldable to a vertical brushing motion, as well as providing for a horizontal brushing motion, said scrub brush

having attached to the opposite surface to the outer bristles surface, a plastic foam layer and on the other two opposed



sides means for cleaning the nails, under the nails and the finger tips.

3,966,336

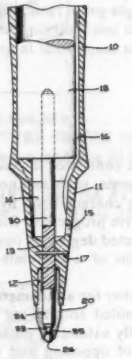
BALL TYPE MARKER CONSTRUCTION WHICH ELIMINATES STICK-SLIP PHENOMENA

Lotfi H. Lotfallah, Hollywood, Calif., assignor to The Gillette Company, Santa Monica, Calif.

Filed May 20, 1974, Ser. No. 471,435

Int. Cl.² B43K 7/10, 5/00

U.S. Cl. 401—209 **5 Claims**



1. In a ball-type marking instrument, wherein a writing ball is rotatably held in a socket of a metallic writing tip element carried by a forward end portion of a thermoplastic composition barrel member, including a rearwardly disposed chamber including a porous reservoir containing ink having an aqueous solution base, the provision of:

means for modifying the stick-slip friction relationships between the ball and its seat while writing and of the provision of means to prevent interruption of writing ability by reason of discontinuity of ink feeding when the instrument is subject to shock,

said means including a feeder rod composed of a bundle of virtually parallel polymeric filaments lightly bonded together, the rear end portion of said rod extending into the ink of said reservoir and a front end face adjacent the rear of the writing ball,

the filaments of said feeder rod being adapted to expand in the presence of ink from the reservoir and to flex and exert a yielding and opposing pressure on the rear of said ball during writing with the frontal surface of said ball,

and means connecting and holding at least the rear portion of said rod in normally fixed and axially immovable relation with respect to the barrel member and ball.

3,966,337

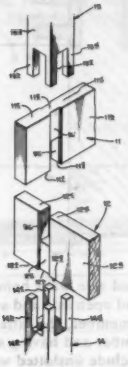
MODULAR POST AND BEAM JOINT

Elsie Crawford, 743 S. Curson, Los Angeles, Calif. 90036

Filed Apr. 18, 1975, Ser. No. 569,268

Int. Cl.² F16D 1/00, 3/00

U.S. Cl. 403—170 **3 Claims**



1. In a modular post and beam joint, the combination comprising

a. first and second transverse beam members defining an intersection with four corners which are vertically elongated, and

b. primary and secondary post members having end portions which extend vertically endwise oppositely in interfitting relation with said beam members at said intersection,

c. the primary post member end portion containing transverse slots which intersect so as to closely receive upper extents of said transverse beam members, and defining four fingers which project downwardly at said respective four corners,

d. the secondary post member end portion containing transverse slots which intersect so as to closely receive lower extents of said transverse beam members, and defining four fingers which project upwardly at said respective four corners,

e. said primary and secondary post member end portions having equal lengths, said primary post member end portion terminating in adjacent relation to the secondary post member end portion, the post members having sliding frictional interfit with the beam members,

f. said first and second beam members containing vertically extending notches respectively receiving second and first beam member extents at said beam member intersection and concealed inwardly of said fingers, and

g. said first and second beam members having chamfered surfaces that are interengaged inwardly of edges defined by said fingers, said chamfered interengaged surfaces holding said members in rigid assembled relation.

3,966,338

COUPLING PIECE

Peter Ghyczy, Kasteel Nieuwenbroek, Beesel, L., Netherlands

Filed July 24, 1975, Ser. No. 598,585

Claims priority, application Germany, Aug. 3, 1974, 7426458

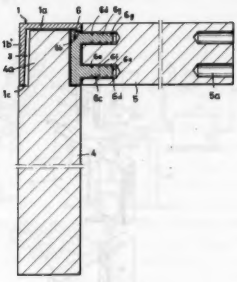
Int. Cl.² A47B 3/06

U.S. Cl. 403—192 **6 Claims**

1. A coupling member for connecting a vertical member

with at least one horizontal member, particularly for the production of furniture, comprising

a substantially cubical-shaped hollow cup having lateral side walls and a closed cup-bottom and being open on a front side opposite said cup-bottom so as to be placed on a stud of a vertical member,



at least one of said side walls being formed with a slot extending into said open side and adapted to receive a guide web of a peg member, the latter for being secured to a horizontal member and having a bearing plate,

said side walls include unslotted walls, and

guide ribs disposed on an inner side of said unslotted walls relative to said hollow cup.

3,966,339

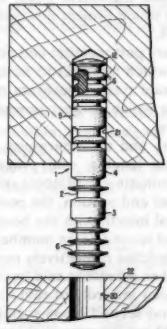
FASTENERS

Borivoj Nemecek, 306 Dorset Square, Hillbrow St. & Harrow Road, Berea, Johannesburg, and Jean M. Lipman, 195 Frances St. East, Observatory, Johannesburg, Transvaal, both of South Africa

Filed Feb. 21, 1975, Ser. No. 551,648

Int. Cl.² F16D *1/00*

U.S. Cl. 403—292 **8 Claims**



1. A dowel fastener of one piece construction formed from suitably high impact strength polymer material comprising a profiled elongated body, the body having a raised central stabilizing formation extending thereform and further raised stabilizing formations which are spaced from the central stabilizing formation and are located towards each end of the body, the said stabilizing formations being operative to stabilize the fastener in a socket therefor, and spaced radially outwardly extendng flexible socket gripping fins extending from and tapering outwardly from the body radially beyond the stabilizing formations and being spaced apart longitudinally on either side of the central stabilizing formation so that the construction is adapted for insertion from either end into a socket of slightly smaller diameter than that of the fins.

3,966,340

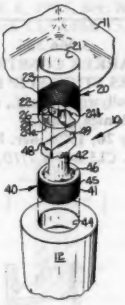
TWIST LOCK CONNECTOR

Max O. Morris, 582 E. Sunset Highway, Issaquah, Wash. 98027

Filed Feb. 27, 1975, Ser. No. 553,796

Int. Cl.² F16B *9/02*; B25G *3/00*; F16D *1/00*

U.S. Cl. 403—353 **11 Claims**



1. A twist lock connector for use in connecting and disconnecting components, such as knock-down furniture components, and being characterized by a construction which provides easy selective progressive friction locking and unlocking thereof to a selected degree by opposite relative right-hand or left-hand rotation of a correlated amount; said connector comprising:

a female member for attachment to one of the components to be assembled and having opposite outer ends and a longitudinally extending passageway therethrough defining a pair of opposing end walls on each side of said passageway on each of said outer ends, said opposing end walls on one of said outer ends each defining opposing camming surfaces thereon; and

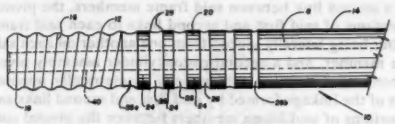
an elongate, longitudinally extending male member having opposite end portions, one of said end portions being adapted for attachment to other of the components to be assembled and having an inside face for abutment with said other end of said female member, the other of said end portions comprising a predetermined configuration for extending through and out of said passageway in said female member at said one end and including at least one flange member projecting transversely outwardly therefrom for being positioned outside of said one end of said female member and having an inside wall defining opposing camming surfaces for cooperatively frictionally engaging and progressively frictionally locking to a desired selective degree with said opposing camming surfaces on said end walls of said one end of said female member upon rotation by a selective predetermined force in either a right-hand or left-hand direction of one of said members relative to the other an amount correlated to the desired degree of frictional locking and for unlocking upon relative rotation by at least an equal force in the opposite direction an amount at least equal to the amount utilized for locking said members.

3,966,341

DRILL STEEL

Edward A. Bailey, Newport, and James F. Ordway, West Lebanon, both of N.H., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Dec. 16, 1974, Ser. No. 533,125
Int. Cl.² F16B 7/18
U.S. Cl. 403—343 9 Claims



1. An elongated, generally uniformly cylindrical drill steel for use in the drilling of holes in rock or like hard formations comprising: a full diameter portion; at least one cylindrical end portion being externally threaded along the axial length thereof and being axially spaced from said full diameter portion; the threads of said one end portion being force-bearing rock drill threads; a transition portion being externally grooved and extending between said full diameter portion and said end portion; said transition portion having groove root diameters which increase from a minimum nearest said end portion to a maximum nearest said full diameter portion; the minimum groove root diameter being approximately equal to the root diameter of the rock drill thread adjacent thereto and the maximum groove root diameter being slightly less than the diameter of said full diameter portion; and the axial length of said transition portion being at least equal to the diameter of said full diameter portion.

3,966,342

INTERIOR STRUCTURE FRAME ASSEMBLY

Mamoru Morlya, Tokyo, Japan, assignor to Seiki Hanbai Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1974, Ser. No. 517,931
Int. Cl.² E04C 2/42; B25G 3/00
U.S. Cl. 403—405 3 Claims

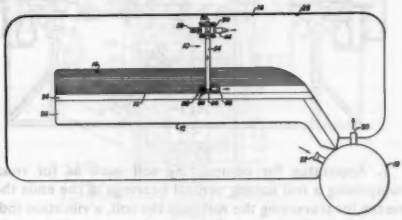
1. A beam holder unit adapted to be disposed in a horizontal hollow transverse beam member to secure the said beam to an upright pillar having a plurality of spaced projections about its periphery extending in the longitudinal direction comprising a first holding member of a substantially U-shaped cross-section with one leg of the U longer than the other and provided with an apex thereon, a second holding member of substantially angular cross-section with one end thereof in the U of the first member, aligned holes in the legs of the U and the second member and screw means disposed in said aligned holes whereby the end of the long leg of the first member and the end of the corresponding member of the second member move toward or away from each other as the screw is turned in or out, the shorter leg of the first member being provided with an inwardly extending pawl and the second member being provided with a corresponding recess to engage the pawl, and the second member being provided with an apex to act as a fulcrum when the second member moves.

3,966,343

STRIP PAVING MACHINE

Perry J. Dick, and Perry J. Dick, Jr., both of Pittsburgh, Pa., assignors to Trumbull Corporation, Pittsburgh, Pa.

Filed Dec. 16, 1974, Ser. No. 532,772
Int. Cl.² E01C 19/12
U.S. Cl. 404—101 12 Claims



1. A paving machine for paving a sloped surface with a castable material in strips having a preselected configuration comprising,

a mobile receiving hopper for continuously receiving the castable material,

first prime mover means positioned in abutting relation with said receiving hopper for forwardly propelling said receiving hopper,

said receiving hopper having an adjustable outlet for discharging the castable material at a controlled rate as said receiving hopper is forwardly propelled,

conveyor means for transporting the castable material laterally from said receiving hopper, said conveyor means having a receiving end portion positioned in material receiving relation with said receiving hopper outlet and a discharge end portion positioned laterally of said receiving hopper,

frame means pivotally connected at one end portion to said receiving hopper and extending laterally relative to said receiving hopper with said conveyor means positioned on said frame means, said frame means being movably supported on the sloped surface and positioned at the other end portion at a preselected height above the sloped surface,

a feed hopper secured to and positioned below said conveyor discharge end portion for receiving the castable material from said conveyor means,

extruding means positioned in the lower portion of said feed hopper above the sloped surface for spreading the castable material onto the sloped surface in accordance with a preselected form,

vibrating means secured to the rearward end portion of said feed hopper for compacting the formed castable material, and

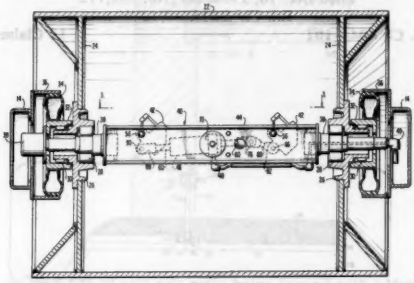
second prime mover means connected to said feed hopper for forwardly propelling said feed hopper on the sloped surface with said conveyor means being positioned on said frame means transverse to the direction of travel of said receiving hopper and said feed hopper.

3,966,344

ADJUSTABLE VIBRATORY ROLLER

Edwin J. Haker, Elm Grove; William H. Buelow, and Charles F. Riddle, both of Brookfield, all of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed Sept. 29, 1975, Ser. No. 617,605
Int. Cl.[2] E01C 19/38
U.S. Cl. 404—117 4 Claims



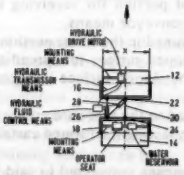
1. Apparatus for compacting soil such as for roadways comprising a roll having central bearings at the ends thereof, means for traversing the roll over the soil, a vibration inducing assembly having end shafts rotatably supported in said bearings and laterally spaced parallel beams, said beams joining said end shafts and having interconnecting trunnions adjacent to said shafts, a weight pivotally mounted on each trunnion and pivotally movable between radially spaced inner and outer positions having reference to the rotational axis of said assembly, each weight having a connecting pin which intersects said axis when the weight is in either of said positions, a hydraulic cylinder located between said connecting pins and supported by and between said beams, said hydraulic cylinder having a double-ended piston rod with its opposite ends respectively connected to the connecting pins of the weights whereby fluid under pressure in one end of said cylinder is effective to move the weights from their outer to their inner positions, and the longitudinal axis of said cylinder and piston rod being substantially coincident with their rotational axis whereby shock and vibration forces applied thereto are minimized.

3,966,345

TANDEM ROAD ROLLER

Ferdinand Kofel, Wallisellen, Switzerland, assignor to Koehring GmbH — Bomag Division, Boppard, Rhine, Germany

Filed Sept. 6, 1974, Ser. No. 503,851
Claims priority, application Germany, Sept. 8, 1973, 2345412
Int. Cl.[2] E01C 19/26
U.S. Cl. 404—126 6 Claims



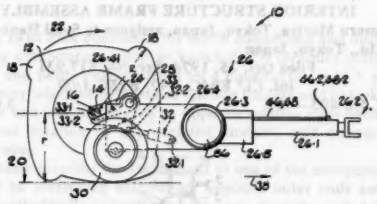
1. In a tandem road roller including a front roll, a rear roll, a roller frame composed of first and second frame members connected together in a jointed manner to form a center pivot steering assembly, with said front roll being rotatably mounted in said first frame member and said rear roll being rotatably mounted in said second frame member, a first piston-cylinder assembly having one end pivotally connected to said first frame member and its other end pivotally connected to said second frame member to form a first link between said frame members for controlling the angular relationship between said frame members to steer said roller, the improvement comprising: a connecting bar member having its opposite ends pivotally connected to respective ones of said frame members to form a second link between said frame members, the pivotal connections of said first and second links to each said frame member being laterally spaced from one another on each said frame member, and a second pistoncylinder assembly pivotally connected between substantially diametrically opposed points of the linkage formed by said first and second links and the portions of said frame members between the pivotal connections of said links and actuable for laterally offsetting said frame members relative to one another in a manner to vary the total width of the rolling track of said roller.

3,966,346

COMPACTOR

Aubrey Ralph Berrange, Pretoria, South Africa, assignor to South African Inventions Development Corporation, Pretoria, South Africa

Filed Dec. 4, 1973, Ser. No. 421,667
Int. Cl.[2] E01C 19/26
U.S. Cl. 404—124 13 Claims



1. A compactor comprising:

a wheeled frame including a pair of laterally spaced ground wheels;

a pair of laterally spaced links pivotally mounted on the frame about a common laterally extending pivot axis;

a roller of non-circular cross-sectional profile rotatably connected to the links about a laterally extending rotational axis spaced from the pivot axis, the roller being disposed between the wheels and being movable between an operative position in which it rests on and can roll along a surface supporting the wheels, and an inoperative position in which it is raised from said surface and supported by the frame; and

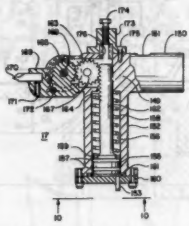
elevator means mounted on the frame and engageable with the roller whereby the roller is movable between its operative and inoperative positions,

the operative position being such that the wheels are supported by the surface to carry the weight of the frame during rolling of the roller, the roller in its operative position being substantially freely pivotable via the links relative to the frame and carrying substantially none of the weight of the frame.

3,966,347
HYDRAULICALLY ACTUATED CUTTING TOOL

Sanders Chapman Watson, 1358 Roller Coaster Road, Tucson, Ariz. 85704

Division of Ser. No. 424,328, Dec. 13, 1973, Pat. No. 3,937,586. This application Aug. 4, 1975, Ser. No. 601,631
Int. Cl.² B23B 29/034, 47/22
U.S. Cl. 408—180 8 Claims



1. In a machine tool ensemble having a machine tool depending from the collet of a rigid spindle machine for rotation therewith and for selectively developing a source of hydraulic fluid under pressure, which fluid exerts a force to laterally displace a carriage mounted within the machine tool, a cutting tool for selectively pivoting a cutting implement, said cutting tool comprising in combination:

a. a holder extending from said cutting tool for engaging the carriage;

b. a piston and cylinder assembly disposed within said cutting tool for effecting movement of said piston commensurate with the pressure within said cylinder;

c. conduit means interconnecting the source of hydraulic fluid with said cylinder for conveying hydraulic fluid into said cylinder to effect translation of said piston;

d. a rack extending from said piston for movement therewith;

e. a housing for supporting the cutting implement, said housing being pivotally connected to said cutting tool to pivot with respect to said holder;

f. gear means interconnecting said housing and said rack for pivoting said housing from an initial position in response to translatory movement of said rack; and

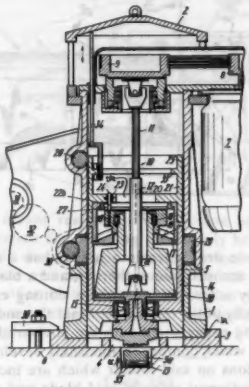
g. means for independently varying the degree and rate of movement of the carriage and the degree and rate of pivotal movement of said housing; and means within the machine tool for generating the source of hydraulic pressure for selectively laterally displacing said cutting tool with respect to the rotation axis of the rigid spindle machine and for selectively pivotally displacing the cutting implement with respect to said holder.

3,966,348
DEVICE FOR TAPPING BORES

Karl Burgsmüller, Haus Hainberg, 3350 Kreiensen, Germany

Filed Oct. 11, 1974, Ser. No. 514,325
Int. Cl.² B23G 1/04, 1/48
U.S. Cl. 408—180 19 Claims

1. A device for tapping bores, especially blind bores, comprising a tubular housing; a spindle journalled at one end thereof inside said housing and having free the other end thereof, said spindle being rotatable in, and axially shiftable along the axis of, said housing; a transversely extending cutter provided at the free end of said spindle; an opening in the bottom of said housing permitting the free end of said spindle to project outside the housing when the spindle is shifted in axial direction; means engageable with the bottom of said housing arranged to align the axis of said housing with the axis of said bore and thus to secure a correct axial introduction of the free end of said spindle into said bore so that said cutter becomes located in the bore with clearance from the bore wall; means for rotating said spindle; means inside said housing cooperating with said spindle for tilting the same to a position in which in extends skew to the axis of the bore and engages the wall thereof to cut, when the spindle is rotated,

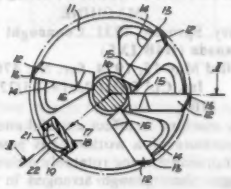


into the bore wall; and means inside said housing providing for gradually axially retracting the rotating spindle outwardly of said bore in dependence on the rotation speed of said spindle so that the rotation of the spindle combines with said retraction and the cutter cuts ascending threads into the bore wall.

3,966,349
ROTATING CUTTER TOOL

Mohamed Osman, and Bernd Greuner, both of Verden, Germany, assignors to Gebrueder Heller, Verden, Germany

Filed Mar. 31, 1975, Ser. No. 563,523
Claims priority, application Germany, Apr. 3, 1974, 2416157
Int. Cl.² B23B 41/02, 51/04
U.S. Cl. 408—204 7 Claims



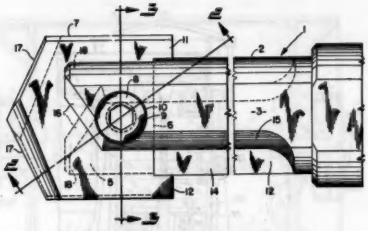
1. A cutter tool for making a hole by rotation about an axis comprising a tool body, at least two cutting blades with cutting edges angled with respect to each other, and a support strip, said cutting blades and said support strip forming a support surface defining a slot for a lubricant film between said support surface and the wall of said hole, so that said support surface is supported on said wall of said hole by said film during the cutting operation, wherein said cutting blades are arranged such that, the resultant reaction force generated by the cutting forces produced by said cutting edges during the cutting operation is directed toward said support strip and has such a magnitude, such that said lubricant film supports said support surface of said support strip without breaking away.

3,966,350

SPADE DRILL

Milton L. Benjamin, Chagrin Falls, Ohio, assignor to Erickson Tool Company, Solon, Ohio

Filed Feb. 24, 1975, Ser. No. 552,696
Int. Cl.² B23B 51/00
U.S. Cl. 408—233 **4 Claims**



1. In a spade drill wherein a holder has a slot extending diametrically across one end thereof, and a blade is clamped in said slot by screw means with its cutting edges disposed axially forwardly of the open end of said slot and with its other end in abutting engagement with the bottom of said slot, the improvement which comprises oppositely beveled straight and flat end portions on said holder which are inclined with respect to the adjacent sides of said blade and which respectively extend from the open end of said slot from a substantial distance beyond the longitudinal center line of said blade angularly toward the bottom of said slot to the other side of said longitudindal center line thus to form with the adjacent sides of said blade passages of obtuse angle cross section which diverge with respect to said cutting edges for flow of chips from said cutting edges when the spade drill is in use; said inclined beveled end portions leaving narrow remaining end portions which support the respective cutting edges against torque load from the bottom of said slot to the open end thereof at said remaining end portions; said holder having longitudinally extending grooves which are of obtuse angle cross section with one side of said grooves being substantially flush with the respective side faces of said blade and with the other side of said grooves intersecting said beveled end portions to form longitudinal continuations of said passages.

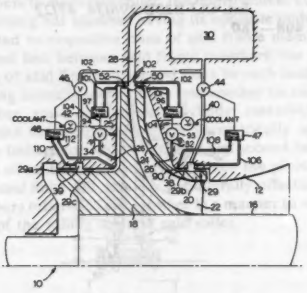
3,966,351

DRAG REDUCTION SYSTEM IN SHROUDED TURBO MACHINE

Robert Stanley Sproule, 4731 Connaught Ave., Montreal, Quebec, Canada (H4B 1X5)

Filed May 15, 1974, Ser. No. 470,150
Int. Cl.² F01D 25/18, 25/22
U.S. Cl. 415—110 **3 Claims**

1. A rotary machine to effect a useful energy exchange by changes in pressure of a working gas passing through the machine, comprising a rotor rotatably mounted in a housing having passages therethrough arranged in flow connecting relation with passages extending through the rotor for the passage of said working gas in energy exchanging relation with the machine rotor, said rotor comprising a rotatable shroud having blade members extending from a radially inner surface of the shroud, the shroud having a first, radially inner boundary and second, radially outer boundary defining an annular surface therebetween, a first gas seal means adjacent said first boundary and a second gas seal means adjacent said second boundary to substantially isolate an annular zone surrounding the shroud, displacer gas supply means connected to the zone to provide low density displacer gas thereto, selected from the group consisting of hydrogen and helium, to reduce parasitic gas drag acting on the shroud, a gas annulus within the zone located adjacent the first seal means having gas supply means connected thereto including inlet flow control valve means to regulate the gas supply, a gas collection gallery within the zone adjacent said second seal to collect said displacer gas together



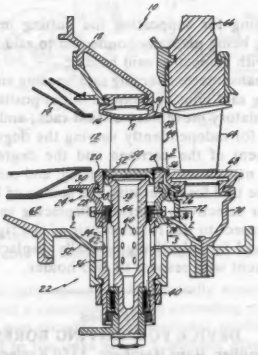
with gas entering through said second seal and gas exhaust passage means connected to said gallery having an exhaust flow control valve connected therewith to regulate the passage of gas including said displacer gas from said zone.

3,966,352

VARIABLE AREA TURBINE

Loren Hawdon White, East Hartford, and John Herman Young, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 30, 1975, Ser. No. 591,554
Int. Cl.² F01D 5/08
U.S. Cl. 415—115 **10 Claims**



1. In a gas turbine engine of the type having an inner shroud and an outer shroud which radially bound a flow path for the working medium gases in the engine, a variable area nozzle including a cantilevered guide vane which is rotatable and has an airfoil section overhanging a portion of the outer shroud, wherein the improvement comprises:

means for controlling the radial clearance between the overhung vane and the opposing outer shroud including a bearing cartridge having a cylindrical bushing which axially and radially positions the rotatable vane,

an annular ring which extends circumferentially about the engine and which is attached to the bearing cartridge, and

means for attaching the outer shroud to the annular ring to axially and radially position the outer shroud thereby

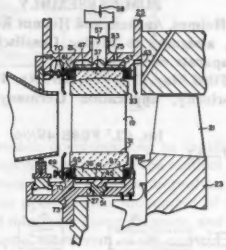
fixing the radial position of said shroud with respect to said rotatable vane.

3,966,353

CERAMIC-TO-METAL (OR CERAMIC) CUSHION/SEAL FOR USE WITH THREE PIECE CERAMIC STATIONARY VANE ASSEMBLY

Claude R. Booher, Jr., West Chester, Pa., and Thomas J. Rahaim, Claymont, Del., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 21, 1975, Ser. No. 551,939
Int. Cl.² F01D *9/02*
U.S. Cl. 415—115 **6 Claims**



1. A ceramic vane assembly for an axial flow gas turbine, said assembly comprising:

an array of stationary ceramic vanes,

radially inner and radially outer ceramic end caps, said end caps having recesses for receiving and locating at least one of said vanes,

a plurality of radially outer metal shoes disposed radially outwardly of said radially outer end caps,

a plurality of radially inner-metal shoes disposed radially inwardly of said radially inner end caps,

radially inner and outer cushioning members disposed, respectively, between said inner and outer shoes and said inner and outer end caps,

radially inner insulator members disposed between said radially inner end caps and said radially inner cusioning members,

radially outer insulator members disposed between said radially outer end caps and said radially outer cushioning members,

radially inner and outer generally arcuate support members having a U-shaped portion, the legs of the U being disposed to extend generally radially for receiving the shoes and cushioning members, the inner portions of the legs having arcuate grooves,

upstream and downstream axial cushioning members disposed in said grooves, and

means for applying a radially inwardly directed force on said shoes to hold said end caps and vanes in position in the assembly.

3,966,354

THERMAL ACTUATED VALVE FOR CLEARANCE CONTROL

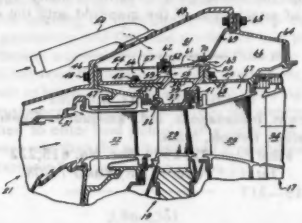
William R. Patterson, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 19, 1974, Ser. No. 534,551
Int. Cl.² F01D *25/12, 25/14*
U.S. Cl. 415—116 **13 Claims**

1. An improved gas turbomachine of the type having a relatively high thermal inertia rotor disposed in close clearance relationship within a stator for operation over a range of temperatures and speeds wherein the improvement comprises:

a. a shroud surrounding a portion of the rotor;

b. a shroud support for positioning said shroud radially with respect to said rotor, said shroud support having a relatively low thermal inertia and adapted to grow radially outward during periods of machine acceleration and shrink during periods of deceleration; and



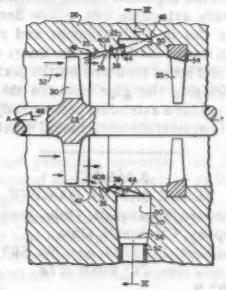
c. valve means responsive to machine acceleration and deceleration for directing a relatively hot fluid medium over said shroud support during periods of machine acceleration and away from said shroud support during periods of machine deceleration so that said shroud support has a relatively fast growth rate and a relatively slow shrinkage rate.

3,966,355

STEAM TURBINE EXTRACTION SYSTEM

Mario F. Pierpoline, Media, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 24, 1975, Ser. No. 589,978
Int. Cl.² F01D *17/00*
U.S. Cl. 415—144 **13 Claims**



1. An extraction system for extracting steam at a predetermined pressure from a steam turbine apparatus for use within an associated user apparatus in a circumferentially uniform manner, the turbine having a rotor with an axis therethrough with a plurality of arrays of rotating blades thereon, a casing disposed circumferentially about said rotor, a plurality of arrays of stationary blades dependent from the casing and alternately disposed axially between adjacent arrays of rotating blades, the alternating arrays of stationary and rotating blades cooperating to define an annular blade path, the extraction system comprising:

an extraction orifice extending circumferentially about the casing, said orifice being disposed axially intermediate an array of rotating blades and the next-axially adjacent array of stationary blades, the orifice having an inlet opening communicating with a throat portion, the throat portion having a dimension that varies from a maximum to a minimum dimension about the circumference of the blade path,

an extraction manifold disposed circumferentially about the casing and communicating with the extraction throat, and,

an extraction pipe connecting the extraction manifold to the associated user apparatus,

the dimension of the throat being sized so that the maximum throat dimension occurs at the point on the circumference of the blade path circumferentially opposite the point of attachment of the manifold with the extraction pipe.

3,966,356

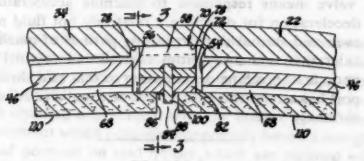
BLADE TIP SEAL MOUNT

John A. Irwin, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 22, 1975, Ser. No. 615,222

Int. Cl.² F01D *11/08*; F04D *17/08*

U.S. Cl. 415—217 **3 Claims**



1. A stationary annular rotor blade tip seal for a turbomachine comprising, in combination, an annular support extending circumferentially around the rotor blades, a seal mount ring composed of a plural number of seal mount segments retained by the support, the circumferential ends of adjacent segments being justaposed with gaps between the segments, the axial edges of the segments having rebent flanges defining a circumferentially extending slot, a low density seal insert mounted in the slot in each segment and retained by the flanges, resilient means for biasing the insert against the said rebent flanges, and strips mounted on the juxtaposed ends of the segments bridging the gaps between the segments, the strips including portions extending between adjacent inserts to retain the inserts against circumferential movement.

3,966,357

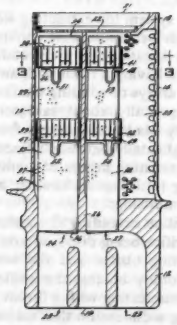
BLADE BAFFLE DAMPER

Robert J. Corsmeier, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Sept. 25, 1974, Ser. No. 509,031

Int. Cl.² F01D *5/18*

U.S. Cl. 416—97 R **6 Claims**



1. An improved turbomachinery blade of the type having a hollow cavity defining an internal wall surface, a cooling insert adapted to be positioned within said cavity, and means for delivering coolant to the interior of said insert, wherein the improvement comprises:

spacing means disposed between said insert and said wall surface, said spacing means having a beveled portion which forms an acute angle with said wall surface; and

a vibration damper positioned between said insert and said internal wall surface, said damper adapted to move radially outward over said beveled portion when acted on by centrifugal force to wedge between said spacing means and said internal wall surface so as to substantially preclude motion of said insert within said cavity during rotation of the blade.

3,966,358

PUMP ASSEMBLY

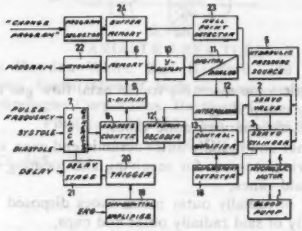
Horst Peter Heimes, Aachen, and Helmut Reul, Duren, both of Germany, assignors to Medac Gesellschaft fur Klinische Spezialpraparate mbH, Germany

Filed May 17, 1974, Ser. No. 471,057

Claims priority, application Germany, Nov. 9, 1973, 2355966

Int. Cl.² F04B *49/06*

U.S. Cl. 417—12 **18 Claims**



1. A pump assembly comprising

a pump, said pump having a piston therein,

a programmable memory for storing a preselected amplitude, frequency and wave-shape variable fluid pumping characteristic,

means for reading out the fluid pumping program stored in said memory,

means for controlling the displacement of said piston in said pump to provide a fluid pumping characteristic in accordance with said stored program,

means for comparing the position of said pump piston with the position thereof established by said stored program, and

means responsive to said comparing means for controlling said pump piston to correct any deviation of the piston position from the position established by said stored program.

3,966,359

APPARATUS FOR BODY HYGIENE

Philippe-Guy Woog, Geneva, Switzerland, assignor to Les Produits Associes, SA, Geneva, Switzerland

Filed Feb. 28, 1975, Ser. No. 554,175

Claims priority, application Switzerland, Mar. 1, 1974, 2895/74

Int. Cl.² F04B *49/02*, *49/08*

U.S. Cl. 417—38 **9 Claims**

1. In apparatus for body hygiene comprising

a. an hydraulic pump driven by an electric motor and adapted to produce liquid pressure pulses,

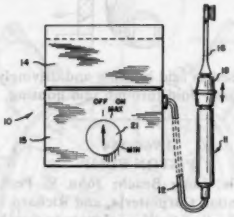
b. an electric switch for said motor,

c. and a hand appliance supplied with said liquid pressure pulses and containing an hydraulic motor actuable by said

pulses to drive a working attachment, particularly a toothbrush attachment, and means for alternatively supplying said pulses to a liquid jet attachment,

d. said pump including pressure regulator means for controlling the pressure of said pulses progressively between maximum and minimum values,

e. a manually actuable control member coupled with said electric switch and pressure regulating means for turning said electric motor on at approximately the position of



the regulator means corresponding to maximum pump pulse pressure upon movement of the control member in one direction from the off position thereof and maintaining the motor on upon further movement of the control member toward minimum pump pressure, and for turning the motor off upon movement of the control member in the opposite direction past a position corresponding to approximately maximum pump pulse pressure to said off position.

3,966,360

CONTINUOUS-FLOW FLUID PUMP

James L. Greene, P.O. Box 171, Columbia, Ky. 42728

Filed Jan. 27, 1975, Ser. No. 544,512
Int. Cl.² F04B *39/02*, *21/04*; F15B *21/04*
U.S. Cl. 417—53 **6 Claims**

1. A fluid pump for subsurface operation, comprising:

a. a pump casing having first and second end portions;

b. a pumping member disposed for movement in said pump casing for pumping fluid into said pump casing through said second end portion and out of said pump casing through said first end portion;

c. an outer casing disposed about said pump casing so as to form a reservoir between said pump casing and said outer casing;

d. at least one valveless opening in said pump casing disposed proximate said first end portion of said pump casing for permitting fluid to flow from said pump casing into said reservoir;

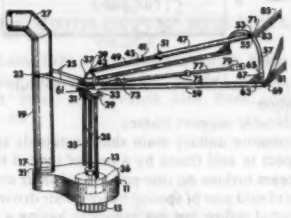
e. at least one valveless opening in said pump casing disposed proximate said second end portion of said pump casing for permitting fluid to flow from said reservoir into said pump casing, the total cross-sectional area of the valveless opening or openings in said pump casing disposed proximate said second end portion of said pump casing being less than the total cross-sectional area of the valveless opening or openings in said pump casing disposed proximate said first end portion of said pump casing, whereby a portion of the pumped fluid may be recirculated between the interior of said pump casing and said reservoir to lubricate continuously said pumping member upon movement thereof and whereby the pumped fluid is permitted to enter said pump casing from said reservoir at a lesser rate than the pumped fluid is permitted to enter said reservoir from said pump casing.

3,966,361

TRACTOR MOUNTABLE ADJUSTABLE HIGH VOLUME WATER PUMP

Bennie L. House, P. O. 577, Hickory Ridge, Ark. 72347

Filed May 19, 1975, Ser. No. 578,720
Int. Cl.² F04B *17/06*
U.S. Cl. 417—231 **9 Claims**



1. A portable water pump adapted to attach to the three-point hitch of a tractor and be powered by the tractor power take-off comprising:

an immersible centrifugal pump impeller and housing therefor,

an outlet conduit extending upwardly from said housing,

a vertical elongated support connected at its lower end to said housing,

a rigid shaft connected to said impeller and extending upwardly from said housing,

a right angle drive unit connected rigidly to the upper end of said support and in driving relation with the upper end of said shaft,

a pair of horizontal arms,

pivot means for connecting said support at one end of said horizontal arms with pivotal movement about a horizontal axis, said axis being above the center of gravity of the entire structure connected to said support including said pump impeller and housing, rigid shaft, and gear drive unit,

a mounting frame rigidly connected to the other ends of said arms with said other ends in spaced apart relation,

coupling means for attaching said mounting frame and horizontal arms to the three-point hitch mechanism of said tractor,

a variable length shaft having a universal joint at one end connected to the input shaft of said gear drive unit and a universal joint at the other end adapted to be connected to the power take-off of said tractor, and

means for adjusting and maintaining the pivotal position of said pump housing and support including,

a brace connected with one end in fixed relation to said mounting frame and horizontal arms and the other end

pivotally attached in fixed relation to said vertical elongated support at a point spaced from said horizontal axis about which said support pivots, and

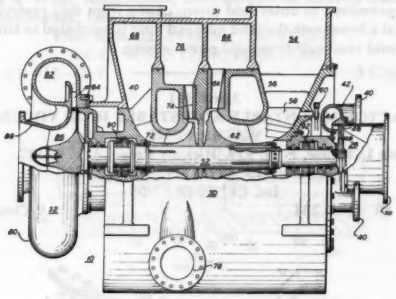
a means for adjusting and maintaining the length of said brace to position said pump housing and support.

3,966,362

PROCESS AIR COMPRESSION SYSTEM

Hans D. Linhardt, Costa Mesa, Calif., assignor to Airco, Inc., Montvale, N.J.

Filed Aug. 24, 1973, Ser. No. 391,117
Int. Cl.² F04B 17/06
U.S. Cl. 417—374 **7 Claims**



1. A pre-assembled air compressor module comprising in combination:

a. a portable support frame;

b. a common unitary main shaft, rotatably supported with respect to said frame by a pair of spaced bearings;

c. a steam turbine on one end of said shaft and outboard of one of said pair of spaced bearings for driving said shaft;

d. a radial inflow hot gas expander having a pressure ratio of at least 5:1 and being located on the other end of said shaft and outboard of the other of said pair of spaced bearings, adapted to expand hot expandable gas for driving said shaft;

e. a multi-stage high pressure ratio compressor on said shaft intermediate said steam turbine and said hot gas expander and between said pair of spaced bearings adapted to be driven by said shaft at least one stage of said compressor having a pressure ratio in excess of about 4:1;

f. said module thereby comprising an intergrated unit requiring no on-site alignment or assembly of elements (b) through (e); and

g. said module having a compressor horsepower rating of at least 1500 HP.

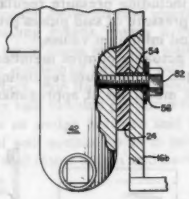
3,966,363

PUMPING ASSEMBLY

William N. Rowley, Palos Verdes Estates, and Gordon F. Ehret, Alhambra, both of Calif., assignors to Weil-McLain Co., Inc., El Monte, Calif.

Filed Sept. 25, 1974, Ser. No. 509,121
Int. Cl.² F04B 17/00, 35/04
U.S. Cl. 417—423 R **7 Claims**

1. A pump assembly comprising a pump housing defining an opening, an electrical motor having an output shaft, means for supporting said motor relative to said housing with a portion of said output shaft extending through said opening, a seal plate of a dielectric material, at least a portion of said seal plate extending between said housing and said support means for insulating said housing from said support means, a plurality of sleeves of dielectric material extending through corresponding openings in said seal plate and said support means, a bolt extending through each sleeve and into said housing to connect said seal plate and said support means to said housing, said seal plate defining an opening for receiving said shaft, and



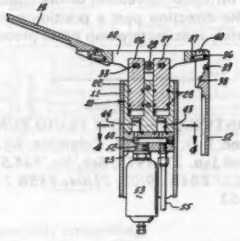
an impeller disposed in said housing and drivingly connected to said shaft to pump fluid through said housing.

3,966,364

PISTON PUMP

Wilfred H. Bachle, Long Beach; John V. Peck, Anaheim; Thomas D. Stantial, Carpinteria, and Richard H. Williams, Corona del Mar, all of Calif., assignors to Oxy Metal Industries (Intra) Inc., Warren, Mich.

Filed Dec. 24, 1974, Ser. No. 536,232
Int. Cl.² F04B 25/04
U.S. Cl. 417—539 **1 Claim**



1. In a single action positive displacement pump, the combination of:

a generally cylindrical pump housing having a cylinder section with first and second axially extending parallel piston openings extending through one end and an inlet and an outlet passage extending from each cylinder opening through the other end of said cylinder section, and a separate manifold section secured to said cylinder section with inlet and outlet openings communicating with said passages;

first and second pistons in the form of solid cylinders having drive ends and valve ends and slidably positioned in said first and second piston openings respectively, with said drive ends projecting out of said one end of said housing;

piston drive means including a rocker arm mounted on said housing between said projecting pistons and directly connected to said drive ends outside said housing;

a first inlet check valve and a first outlet check valve in corresponding passages in said cylinder section in communication with said first piston opening;

a second inlet check valve and a second outlet check valve in corresponding passages in said cylinder section in communication with said second piston opening;

inlet passage means in said manifold section connecting said inlet openings to said inlet check valves;

outlet passage means in said manifold section connecting said outlet openings to said outlet check valves;

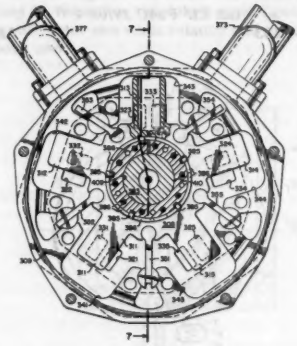
means defining an accumulator chamber communicating with one of said passages in said manifold section; and

outer housing means surrounding said cylinder section, manifold section and accumulator.

3,966,365
HYDRAULIC POWER TRANSMISSION AND BRAKING SYSTEM FOR VEHICLES

Bernhard Ulrich, Jr., Corpus Christi, Tex., assignor to Tex Trans Inc., Corpus Christi, Tex.

Division of Ser. No. 305,513, Nov. 10, 1972, Pat. No. 3,827,239. This application July 3, 1974, Ser. No. 485,632
Int. Cl.² F01C *21/00*
U.S. Cl. 418—29 **16 Claims**



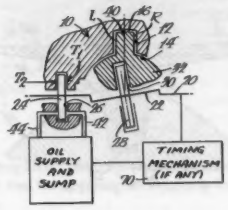
1. A variable displacement hydraulic machine comprising:
a cylindrical casing having a pair of parallel spaced end walls and a plurality of circumferentially spaced chambers, each chamber having a pair of hydraulic fluid ports in an end wall thereof;
an orbiting member disposed within said cylindrical casing, said orbiting member having a pair of parallel spaced surfaces for intimately contacting said end walls of said cylindrical casing, and a plurality of legs extending radially into said circumferentially spaced chambers for covering and uncovering said hydraulic fluid ports during the orbiting motion of said orbiting member;
a plurality of movable vanes connecting said orbiting member at points intermediate said legs to said cylindrical casing at points intermediate said chambers, said vanes intimately contacting said end walls of said cylindrical casing to provide fluid seals between adjacent chambers;
an eccentric shaft having a first end and a second end, the first end of said eccentric shaft being rotatably mounted at a point on the axis of said cylindrical casing, said orbiting member being journaled on said eccentric shaft at a point intermediate its ends; and
variable eccentric carrier means rotatably mounted on the axis of said cylindrical casing for rotatably engaging said second end of said eccentric shaft at a variable radius from the axis of said cylindrical casing so as to cause said second end of said eccentric shaft to follow an orbital path about the axis of said cylindrical casing whereby variation of the radius of said orbital path varies the radius of the orbital path of said orbiting member thus varying the displacement of said hydraulic machine.

3,966,366
DEFLECTION COMPENSATION FOR SLANT AXIS ROTARY MECHANISMS

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 25, 1975, Ser. No. 616,787
Int. Cl.² F04B *1/16*
U.S. Cl. 418—53 **11 Claims**

1. A slant axis rotary mechanism comprising:
a housing defining an operating chamber;
a shaft journalled in said housing and having an angularly offset portion within said chamber, said shaft being slightly axially movable with respect to said housing;

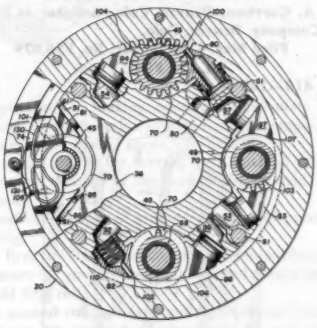


a rotor within said chamber and journalled on said angularly offset portion;
and means for cyclically axially oscillating said shaft during operation of said mechanism to compensate for deflection during such operation.

3,966,367
HYDRAULIC MOTOR OR PUMP WITH MOVABLE WEDGE

Lewis C. Erickson, 3328 E. Superior St., Duluth, Minn. 55804

Filed Jan. 16, 1975, Ser. No. 541,402
Int. Cl.² F01C *19/04, 19/08, 1/10;* F04C *1/06*
U.S. Cl. 418—58 **21 Claims**



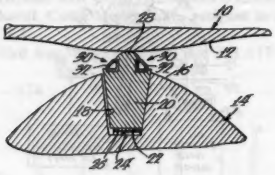
1. In a fluid motor or pump, the combination comprising:
internal ring gear means operably secured within a housing;
pinion gear means rotatably mounted to mesh with said ring gear means;
wedge means, having a shape conforming to the outer peripheries of said ring and pinion gears to provide a sealing effect and pressure or suction chamber, said wedge means having a piston end and porting in the tip thereof communicating with said chamber forming a hydrostatic pressure means having a hydrostatic pressure in an operable direction to overcome pressure from said chamber;
supporting means within said housing supporting said pinion gear means and supporting said wedge means for slidable movement;
means for delivering fluid under pressure from a source to said pressure chamber; and,
means for returning fluid to said source.

3,966,368

INSULATED SEAL FOR ENGINES

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 15, 1975, Ser. No. 541,183
Int. Cl.² F01C 21/06, 19/04; F16J 9/12
U.S. Cl. 418—83 7 Claims



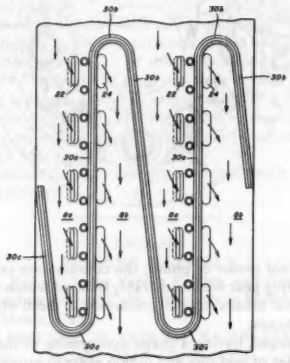
1. In an internal combustion engine including a housing having an interior wall defining a combustion chamber, a member movable within said housing and subjected to hot gases of combustion and a seal mounted on said member for movement therewith and having a surface in engagement with said interior wall to establish a seal between said member and said interior wall, the improvement comprising at least one insulating member carried by said seal spaced from but adjacent said surface and in heat transfer resisting relation to said combustion chamber to resist heat transfer from said hot gases of combustion to said seal and said surface thereof whereby said seal may run at a cooler operating temperature to reduce wear.

3,966,369

INLET AND OUTLET PORTS AND SEALING MEANS FOR A FLUID DRIVEN MOTOR

Marion A. Garrison, Denver, Colo., assignor to Empire Oil Tool Company, Denver, Colo.

Filed Mar. 6, 1975, Ser. No. 556,079
Int. Cl.² F04C 27/00
U.S. Cl. 418—149 10 Claims



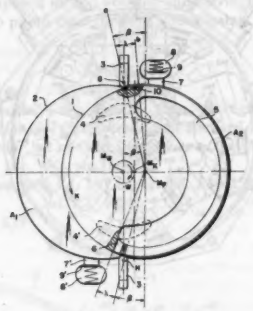
6. In a motor or pump comprising a housing having a cylindrical bore therein, a rotor mounted coaxially for rotation in said bore, inlet port means opening through said housing, and outlet port means opening through said housing and spaced circumferentially from said inlet port means; the improvement comprising locating said inlet and outlet port means in the same longitudinal location alternately in circumferentially spaced relationship about the housing and providing sealing means externally of said housing isolating said inlet port means from said outlet port means and from one end of said housing and isolating said outlet port means from the other end of said housing.

3,966,370

ROTARY PISTON MACHINE FOR TRANSPORTING LIQUID OR GASEOUS MEDIA

Franz Huf, Constance, Germany, assignor to Dornier System GmbH, Germany

Filed Jan. 29, 1975, Ser. No. 545,185
Claims priority, application Germany, Feb. 5, 1974, 2405308
Int. Cl.² F04C 29/08
U.S. Cl. 418—183 12 Claims



1. In a rotary piston machine of trochoidal construction for transporting a fluid medium, having working chambers formed between a trochoidal piston and a housing corresponding to the coordinated outer envelope curve, said chambers being separated from each other by radial seals in the housing, wherein the medium is supplied through openings within the inner envelope curve in the housing side wall and in a recess in the piston and passes from the recess by way of control openings in the peripheral piston surface to the working chamber, and having outlet openings in the housing closed-off by check valves,

the improvement comprising

a. the piston has the form of a saddle-free epitrochoid 1:1,

b. the supply openings in the housing side wall are diametrically opposed and in the area of the radial seals,

c. the piston recess is in the front piston wall and extends over such a portion of the piston that during rotation, continuously at least one supply opening and, in the dead-center position of the piston, both diametrically opposed supply openings are in communication with said recess, and

d. in the dead-center position of the piston, the control openings are positioned immediately ahead of one radial seal shortly prior to the passage of said openings from the suction side to the pressure side.

3,966,371

ROTARY, POSITIVE DISPLACEMENT PROGRESSING CAVITY DEVICE

Lawrence W. Berzanske, 8000 Garfield Road, Mentor, Ohio 44060

Continuation of Ser. No. 412,205, Nov. 2, 1973, abandoned. This application Feb. 19, 1975, Ser. No. 551,028
Int. Cl.² F04C 17/04
U.S. Cl. 418—197 3 Claims

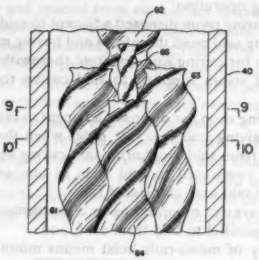
1. A rotary, positive displacement, progressing cavity device comprising:

a fluid inlet and a fluid outlet in spaced relation relative to a central flow axis,

four inter-engaging helical rotors symmetrically spaced around said central flow axis and mounted for rotation

about their respective axes of symmetry, said rotors, as viewed in transverse cross section, defining four, two-lobed plane figures with curved tips, each in the same orientation relative to a radial line from its axis to said central flow axis and in engagement with the two adjacent plane figures throughout the synchronized rotation thereof, to define therebetween an enclosed region that varies from a maximum area when said plane figures are oriented perpendicular to their respective radial line to a minimum area when said plane figures are oriented in alignment with said radial line.

each rotor having a helical surface form generated by translating its respective two-lobed plane figure along its respective rotor axis while rotating said plane figure thereabout, and



a central sealing element mounted for free rotation about said flow axis and having an axial twist with a pitch corresponding to the pitch of the helices formed in said rotors,

said sealing element as viewed in transverse cross section defining four concave sides with radii corresponding to the curved tips of said rotors to provide a tight seal therewith at axial locations whereat said two-lobed plane figures are oriented in alignment with their respective radial lines,

whereby said rotors and said sealing element define therebetween closed cavities symmetrical about said axis and in aligned endwise relation, that progress axially along said central flow axis from said inlet to said outlet in response to synchronized rotation of said rotors and said sealing element.

3,966,372

INJECTION MOLDING APPARATUS FOR FORMING A COMPOSITE, FOAM-SKIN, ARTICLE

Akio Yasuike; Takehiro Shibuya; Kaoru Toyouchi, all of Yokohama, and Susumu Imai, Kanagawa, all of Japan, assignors to Asahi-Dow Limited, Japan

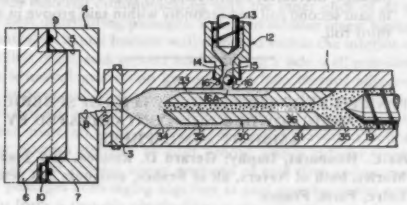
Filed May 16, 1974, Ser. No. 470,662

Claims priority, application Japan, May 28, 1973, 48-58706; May 29, 1973, 48-59331; June 19, 1973, 48-68299; Dec. 3, 1973, 48-134284; Jan. 29, 1974, 49-12013; Apr. 15, 1974, 49-42060

Int. Cl.² B29D *27/00*; B29E *3/00*

U.S. Cl. 425—4 R **6 Claims**

1. An apparatus for injection molding an article having a sandwich construction comprising: mold means having a mold cavity, an injection cylinder having at its front end a nozzle connected with the mold cavity of said mold means, a movable mandrel mounted slidably within said injection cylinder to divide the interior of the cylinder into front and rear chambers, said movable mandrel having at its forward portion a reduced part to form an annular passage together with the inside surface of said cylinder, said mandrel having a central passage therethrough aligned with said nozzle for connecting the rear chamber to the front chamber in only a central area of the cross-sectional plane of the injection cylinder, means for supplying a first thermoplastic resin for the shell of an article to the front chamber, said supplying means being connected with said annular passage, and means for charging a



second thermoplastic resin for the core of the article in the rear chamber and for applying an injection force to the second resin therein.

3,966,373

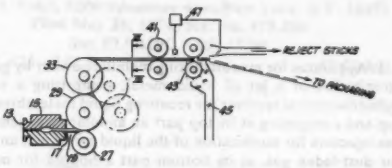
APPARATUS FOR THE CONTINUOUS EXTRUSION OF SMALL CROSS-SECTION THERMOPLASTIC FOAM PROFILES

Keith G. Johnson, Pittsburgh, Pa., assignor to ARCO Polymers, Inc., Philadelphia, Pa.

Division of Ser. No. 419,811, Nov. 28, 1973, abandoned. This application Jan. 22, 1975, Ser. No. 542,973

Int. Cl.² B29G *7/00*

U.S. Cl. 425—4 C **1 Claim**



1. Apparatus for making continuous extrudate having a predetermined cross section profile, from thermoplastic material containing a blowing agent, comprising:

a. extrusion means for forcing said material in a molten condition through a die connected to said extrusion means;

b. a confined passage of predetermined configuration comprising:

1. a first roll having a projection on its surface, internal means for cooling said first roll, and means for rotating said first roll;
2. a second roll having a groove in its surface, internal means for cooling said second roll, and means for rotating said second roll;
3. said first and second rolls being located adjacent one another, but touching only in the area of said confined passage, such that the projection of the first roll intermeshes with the groove in the second roll; and
4. the height of said projection beyond the first roll being less than the depth of said groove in the second roll such that when said projection intermeshes with said groove, a confined passage of predetermined configuration is defined between the top of said projection and the bottom of said groove;

c. said confined passage being spaced apart from said die to provide an unconfined zone therebetween;

d. a third roll having a groove in its surface, internal means for cooling said third roll, and means for rotating said third roll; said third roll being located adjacent but not touching said second roll such that the grooves on the two rolls are in alignment; and

e. means for removing said extrudate from said third roll; whereby said extruded material is formed in said confined passage, thereafter confined solely first within said groove in said second roll and secondly within said groove in said third roll.

3,966,374

APPARATUS FOR THE MANUFACTURE OF SPHERICAL METALLIC POWDER NON-CONTAMINATED BY AMBIENT ATMOSPHERE

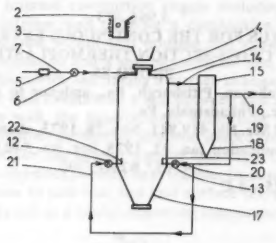
Yves C. Honnorat, Imphy; Gerard D. Raisson, and Jean G. Morlet, both of Nevers, all of France, assignors to Creusot-Loire, Paris, France

Filed Dec. 11, 1974, Ser. No. 531,812

Claims priority, application France, Dec. 20, 1973, 73.45788

Int. Cl.² B28B *1/54*

U.S. Cl. 425—7 **3 Claims**



1. Apparatus for manufacturing metallic powder by gaseous atomization of a jet of liquid metal, comprising a vertical cylindro-conical receiver for receiving liquid metal through its top and comprising at its top part an annular arrangement of gas injectors for atomization of the liquid metal and an outlet for dust-laden gas, at its bottom part a hopper for metallic powder, and means for introducing gas into the bottom half of its cylindrical portion comprising a plurality of jets arranged tangentially to a theoretical cylinder centered on the axis of said receiver and opening in the same direction with respect to said axis and tilted from 0° to 60° with respect to the horizontal to cause vortices of inert gas and metallic powder and said theoretical cylinder passing through the outlet orifices of said jets.

3,966,375

RAIL MOUNTED APPARATUS FOR MANUFACTURING CONCRETE POLES

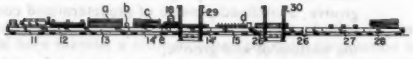
Yoshikiyo Fukushima, Tokyo; Kenzo Momota; Hideaki Shirahata, both of Kawasaki, and Noriyuki Sakanai, Kashiwa, all of Japan, assignors to Nippon Concrete Industries, Co., Ltd., Tokyo, Japan

Filed July 30, 1974, Ser. No. 493,054

Claims priority, application Japan, Feb. 12, 1974, 49-16167

Int. Cl.² B28B *5/04*

U.S. Cl. 425—62 **2 Claims**



1. Movable apparatus, for manufacturing concrete poles, which includes a train of cars movably running on rails, comprising:

a boiler car having a boiler disposed thereon for supplying steam for use in a curing operation of said concrete poles;

a wire storage car connected to said boiler car having wires stored thereon for use in forming a wire cage for said concrete poles;

a caging stand car connected to said wire storage car having wire caging machines and an upsetter device disposed thereon for fabricating reinforcing wire cages from said stored wires;

a molding shop car connected to said caging stand car having a mold disposed thereon, for receiving said wire cage therewithin, and concrete supply means secured thereto for supplying concrete to said mold;

a spinning machine car connected to said molding shop car having a spinning machine disposed thereon for spinning said mold when charged with concrete;

at least one empty car connected to said spinning machine car for receiving said mold therefrom subsequent to a spinning operation;

a steam curing room disposed adjacent to said empty car for receiving said mold therefrom and having means disposed thereon for curing said concrete therewithin in the presence of steam supplied to said curing room from said boiler;

a demolding shop car disposed adjacent to said curing room for receiving said concrete poles when the same are removed from said mold after said curing operation;

a tractor connected to said train at one end thereof for moving said cars along said rails;

a mold traverser mounted upon a supplementary rail disposed parallel to said train rails; and

a plurality of mono-rails hoist means mounted upon rails disposed transversely of said train rails and said supplementary rail, said demolding shop car and said steam curing room being disposed beneath one of said hoist means, whereby said hoists can move said molds between said train, disposed upon said train rails, and said traverser, as well as between said train and said steam curing room and said demolding shop car.

3,966,376

SLIP FORM ARRANGEMENT FOR CONSTRUCTING ANNULAR STRUCTURES

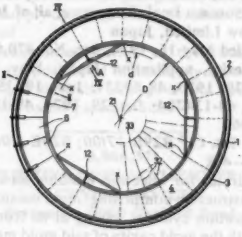
Otto Heinzle, Sonderberg 19, 6840 Gotzis (Vorarlberg), Austria

Continuation-in-part of Ser. No. 405,880, Oct. 12, 1973, Pat. No. 3,897,182. This application Feb. 18, 1975, Ser. No. 550,835

Claims priority, application Austria, Oct. 13, 1972, 8812/72; Feb. 19, 1974, 1341/74

Int. Cl.² E04G *11/22*

U.S. Cl. 425—63 **15 Claims**



1. A slip form arrangement for pouring a concrete mixture comprising:

a. three upright columns;

b. a slide member mounted on each column for vertical movement;

c. an annular frame extending about an upright axis in a surface transverse to said columns,

1. said columns defining a triangle about said axis in a plane perpendicular to said axis;

d. carrier means connecting said slide members and said frame and including a plurality of fastening means engaging respective circumferential portions of said frame,

1. said portions being circumferentially spaced from each other,

2. the number of said portions and of said fastening means being greater than the number of said columns;

f. a plurality of elongated beam members;

g. attaching means one longitudinal end portion of each beam member to said frame in a position in which the direction of elongation of each beam member is substantially horizontal and outwardly away from said frame;

h. an annular form assembly including an outer form wall and an inner form wall respectively remote from and near said frame and spaced from each other in said direction, said form assembly enveloping said columns;

i. securing means releasably securing respective portions of each of said walls to the other longitudinal end portions of said beam members, the secured walls depending from said beam members and holding said other end portions in transversely spaced relationship; and

j. means operatively interposed between said slide members and said upright columns for holding said slide members in predetermined vertical positions on said upright columns and for thereby transmitting a portion of the weight of said frame and of said form assembly to each of said columns.

3,966,377

BLOWHEAD FOR TUBULAR FILM

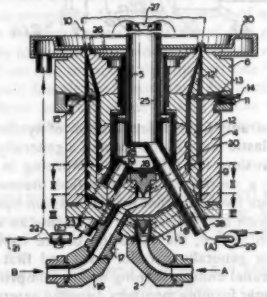
Hartmut Upmeier, Tecklenburg, and Werner-Josef Zimmermann, Lengerich, both of Germany, assignors to Windmoller & Holscher, Lengerich, Germany

Filed Apr. 17, 1974, Ser. No. 461,799

Claims priority, application Germany, Apr. 24, 1973, 2320687

Int. Cl.² B29D 7/02

U.S. Cl. 425—72 R **4 Claims**



1. A blow-head for producing tubular film from thermoplastic molten material comprising, a tubular housing having an interior and an annular outlet nozzle for molten material, a first tubular insert having a conically shaped bottom wall disposed within said housing interior, said first insert having a side wall provided with a helical groove on the outer surface thereof adjacent said bottom wall, said first insert side wall defining with the inner surface of said housing a first flow passage for said molten material, said first flow passage having a helical lower portion defined by said groove and a tubular upper portion, a plurality of circumferentially spaced, radially extending first distributing passages in said first insert bottom wall, said first distributing passages having axially disposed inner ends and outer ends communicating with said helical portion of said first flow passage, a first supply conduit for molten material communicating with the inner ends of all of said first distributing passages, a second tubular insert having a conically shaped bottom wall disposed within the interior of said first inert, said second insert having a side wall provided with a helical groove on the outer surface thereof adjacent said bottom wall, said second insert side wall defining with the inner surface of said first insert a second flow passage for said molten material, said second flow passage having a helical lower portion defined by said groove and a tubular upper portion, said tubular upper portions of said first and second flow passages converging together at said annular outlet nozzle to form a two-ply plastic film, a plurality of circumferentially spaced, radially extending second distributing passages in said second insert bottom wall, said second distributing passages having axially disposed inner ends and outer ends communicating with the helical portion of said second flow passage, a second supply conduit for molten material communicating with the inner ends of all of said second distributing passages, coaxially extending air inlet and outlet means within said housing including at least one air inlet tube extending through the bottom walls of said first and second inserts and at least one outlet tube extending through the bottom walls of said first and second inserts, said inlet and outlet tubes disposed between said first and second distributing passages and extending to the exterior of said housing.

3,966,378

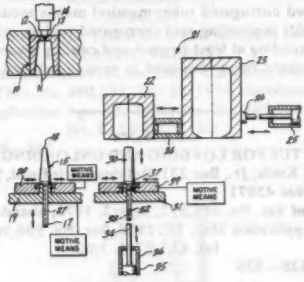
APPARATUS FOR MAKING ORIENTED HOLLOW PLASTIC ARTICLES

Emery I. Valyi, 5200 Sycamore Ave., New York, N.Y. 10471

Filed May 28, 1974, Ser. No. 473,580

Int. Cl.² B29C 1/00, 17/00

U.S. Cl. 425—242 B **41 Claims**

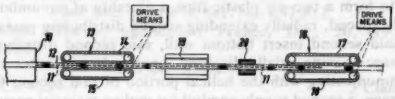


1. An apparatus for forming objects of moldable organic plastic material which comprises: at least one first core; means cooperating with said first core and aligned therewith for providing a parison thereon; a first mold spaced from said first core and engageable with said first core for forming said parison; means operatively connected to and carried by said first core for forming said parison located on said first core; means associated with said first core and said first mold for bringing together and for separating said first core and said first mold, said separating leaving said formed parison retained in said first mold free from said first core; at least one second core in spaced relationship to said first core; means including said first mold for transferring said formed parison from said first mold to said second core; at least one second mold in spaced relationship to said first mold; means associated with said second core and second mold for transferring said formed parison into said second mold; means on said second core for expanding the formed parison in said second mold.

3,966,379
APPARATUS FOR MAKING CORRUGATED FLEXIBLE TUBING

Patrick William O'Brien, Springhead, near Oldham, England, assignor to Compoflex Company Limited, England

Division of Ser. No. 773,859, Nov. 6, 1968, Pat. No. 3,793,423. This application Dec. 12, 1973, Ser. No. 424,051
Claims priority, application United Kingdom, Nov. 6, 1967, 50382/67; Dec. 20, 1967, 57933/67
Int. Cl.² B29C 17/02
U.S. Cl. 425—327 3 Claims

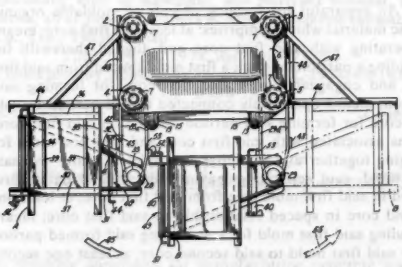


1. Apparatus for the manufacture of flexible compressed corrugated tubing comprising extruder means for extruding tubing of a plastics material, said tubing having annular corrugations longitudinally thereof; first haul-off means for engaging and feeding said corrugated tubing emerging from said extruder means, said first haul-off means being positioned downstream from said extruder means; heating means for heating said tubing, said heating means being positioned downstream from said first haul-off means and spaced from said corrugated tubing; second haul-off means for engaging and moving said corrugated tubing, said second haul-off means being positioned downstream from said heating means; first and second drive means connected respectively to said first and second haul-off means for respectively driving said first haul-off means and said second haul-off means at first and second feed rates, said second feed being substantially slower than said first feed rate so as to cause compression of said tube; cooling means positioned between said heating means and said second haul-off means for cooling and setting the compressed corrugated tube; mandrel means secured to said extruder for supporting said corrugated tubing, said mandrel means extending at least beyond said cooling means, and said cooling means being disposed in spaced relation from said mandrel.

3,966,380
APPARATUS FOR LOADING AND UNLOADING PRESSES

Samuel J. Kosik, Jr., Box 231, Botkins Angle Road, New Knoxville, Ohio 45871

Division of Ser. No. 356,592, May 2, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 556,964
Int. Cl.² B29C 3/00
U.S. Cl. 425—338 1 Claim

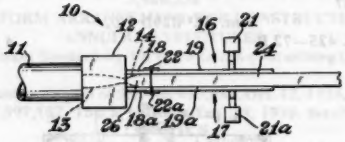


1. In apparatus of the class described, in combination, a press comprising a base, a header spaced therefrom and connected thereto, a series of platens for supporting molds adjustably supported in spaced relation between the base and header, said spaced relation providing for receiving molds therebetween, while facilitating opening and closing movement thereof, means comprising adjustable connections from the header to an adjacent platen and from each adjacent platen to the platen adjacent thereto, to support molds of substantially different thicknesses between any of said platens during repeated opening and closing movement, table means to move the platens toward the header and to support the platens upon movement away from the header, a series of means at opposite sides of said openings to support molds for loading the same with moldable material and unloading molded products from such molds, such means including instrumentalities to enable the molds to be moved into alignment with the openings and to receive molds therefrom to be thereafter moved to one side or the other of the openings on the support means, the series of means at one side for supporting a series of first molds, and the series at the other side supporting a series of second molds, and being swingable toward and from the openings, the said support means being wing-like members separately swingable toward and from the openings.

3,966,381
EXTRUSION OF THERMOPLASTIC FOAM

Kyung W. Suh, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 417,845, Nov. 21, 1973, Pat. No. 3,897,528. This application Mar. 17, 1975, Ser. No. 559,290
Int. Cl.² B29D 27/00; B29F 3/04
U.S. Cl. 425—376 2 Claims



1. An apparatus for the preparation of synthetic resinous closed cell plastic foam in the form of a generally rectangular body by extrusion, the apparatus comprising in cooperative combination a source of heat plastified thermoplastic synthetic resinous foamable mobile gel, a die in operative communication with said source, the die having an elongate slit-like extrusion orifice, the extrusion orifice having first and second major generally parallel sides and first and second generally parallel ends, a shaping means comprising a pair of generally planar forming members disposed external to the die and in spaced, generally parallel relationship to the major sides of the extrusion orifice, the shaping means adapted to receive extruded foamable gel from the extrusion orifice therebetween, the improvement which comprises

a pair of generally concave restraining means positioned adjacent the ends of the die to constrain the freshly extruded gel in generally convex configuration in the plane of the slit and axis of extrusion at a location adjacent the die and a portion of the forming means adjacent the die with the further limitation that the generally concave restraining means has a generally convex surface in a plane perpendicular to the axis of extrusion whereby the apparatus provides a foam extrude of improved density uniformity and without apparent collapse of the foam.

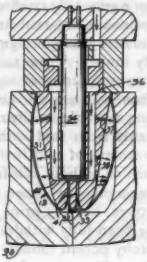
3,966,382
APPARATUS FOR FORMING THIN-WALLED PLASTIC ARTICLES

Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 514,521, Oct. 15, 1974, Pat. No. 3,923,370, and a continuation-in-part of Ser. No. 214,275, Dec. 30, 1971, abandoned. This application Apr. 24, 1975, Ser. No. 571,329

Int. Cl.² B29D *23/03*

U.S. Cl. 425—387 B **3 Claims**



1. An apparatus for blow molding relatively thin walled hollow thermoplastic articles with controlled wall thicknesses using molded thermoplastic preforms having a central continuous annular portion formed to extend from one interior wall of said preform comprising:

an elongated mandrel having an axis extending longitudinally thereof and having the shape of the interior of said preform and including a pin projection positioned on said axis and to be received within said continuous annular portion of said preform and a concentric continuous annular projection formed on said mandrel to encircle said pin projection thereby defining a continuous annular recess mechanically locking said preform on said mandrel in a direction substantially perpendicular of said axis during blow molding, a female blow mold having the interior shape of said article,

and said mandrel and said female blow mold being relatively formed to cooperate for initial blowing of said preform with said continous annular portion of said preform mechanically locked within said recess of said mandrel and spaced from and immediately adjacent one interior surface of said female blow mold and for final blowing of said preform into the shape of said article with a final blowing of said continuous annular portion of said preform.

3,966,383
APPARATUS FOR EMBOSSING FILM

Francis H. Bussey, Jr., Rosedale, and James K. Rutherfoord, Terre Haute, both of Ind., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 30, 1974, Ser. No. 537,195

Int. Cl.² B29C *17/00*

U.S. Cl. 425—388 **7 Claims**

1. In an apparatus for vacuum embossing sheet material, the combination comprising:

a. a pair of spaced apart, generally parallel end plates;

b. a pair of spaced apart, parallel, hollow rollers rotatably connected to said end plates, one of said rollers having heating means connected thereto, the other of said rollers cooling means connected thereto;

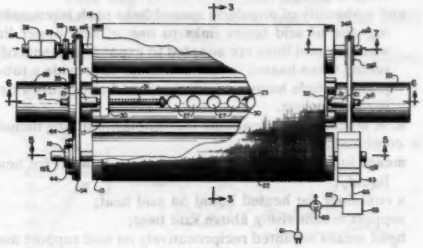
c. an endless, seamless, flexible, porous screen fitted over said rollers connecting said rollers together to cause one roller to rotate when the other roller rotates;

d. drive means connected to one of said rollers to rotate said roller and advance said screen;

e. a vacuum assembly connected to said end plates and engaging a portion of the underside of said screen that extends between said rollers, said assembly positioned between said pair of rollers and partially inside said screen so that the portion of said screen passing over said roller having heating means connected thereto contacts said vacuum assembly before contacting said roller having cooling means connected thereto, said assembly including:

i. a vacuum manifold means connected to said end plates;

ii. seal roll retainer means connected to said manifold means;



iii. a pair of spaced apart cylindrical seal rolls rotatably supported by said seal roll retainer means and said manifold means, each of said seal rolls rotatably contacting the underside of said screen;

iv. two movably mounted end seal members connected to said end plates by adjusting means adjacent each end of said seal rolls, said end seal members making sliding, sealing contact with said manifold means, both of said seal rolls and the underside of said screen to provide a vacuum chamber underlying that portion of said screen lying between the lines of contact made on the underside of said screen by said seal rolls.

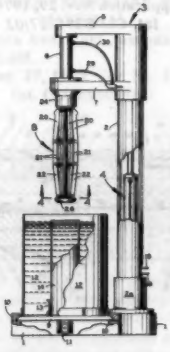
3,966,384
MACHINE FOR THE THERMAL EXPANSION OF RIGID PLASTIC TUBING

Johann H. Maier, 18584 NE. Second Ave., Miami, Fla. 33162

Division of Ser. No. 490,234, July 22, 1974, abandoned. This application Apr. 14, 1975, Ser. No. 567,503

Int. Cl.² B29C *17/02*

U.S. Cl. 425—392 **9 Claims**



1. A machine for expanding thermoplastic tubing including in combination:

means forming a base for supporting a container for heated liquid;

a container for heated liquid on said base;

support means rising above said base;
head means mounted reciprocatively on said support means above said base for reciprocation toward and away from said container on said base;
drive means operatively associated with said head means for reciprocating said head means; and
expanding means mounted on said head means comprising a rod secured to said head means and extending downard therefrom for reciprocation thereby;
a plurality of angularly spaced upper links pivotally fixed relative to said rod;
a plurality of angularly spaced lower links pivotally secured relative to said rod;
and a plurality of angularly spaced links each interconnecting one of said lower links to one of said upper links, whereby said links are adapted to expand segments of the tubing when heated in said container to provide a tubular plastic article having angularly spaced outwardly extending projections.

8. A machine for expanding thermoplastic tubing including in combination:
means forming a base for supporting a container for heated liquid;
a container for heated liquid on said heat;
support means rising above said base;
head means mounted reciprocatively on said support means above said base for reciprocation toward and away from said container on said base;
drive means operatively associated with said head means for reciprocating said head means; and expanding means mounted on said head means comprising
a rod secured to said head means and extending downward therefrom for reciprocation thereby,
a plurality of flexible expanding devices spaced apart circumferentially around said rod and each being elongated lengthwise of the rod,
and means operatively connecting both ends of said expanding devices to said rod to be expanded outwardly by the axial movement of the rod in one direction, whereby to expand corresponding portions of the thermoplastic tubing in the heated liquid in said container to form a tubular plastic article having circumferentially spaced outwardly extending projections.

3,966,385

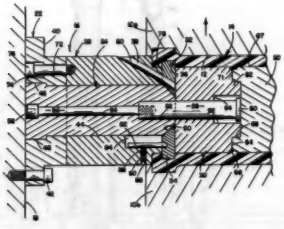
APPARATUS FOR FORMING A GROOVE IN A TUBE

Wayne Spears, 12884 Bradley Ave., Sylmar, Calif. 91342

Continuation-in-part of Ser. No. 422,776, Dec. 7, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,259

Int. Cl.² B29C *17/02*

U.S. Cl. 425—393 **21 Claims**



1. Apparatus for molding an annular groove internally of a tubular molded part, said apparatus comprising an extendible and retractable core assembly which comprises:
a. means defining a base having a longitudinal axis and means defining an outer mold surface for molding the interior of a generally tubular molded part, said mold surface having a pair of ends, said base means being movable along said axis;
b. a plurality of mold segments mounted on said base means circumferentially around and intermediate the ends of said mold surface for axial movement relative to said outer mold surface and radial movement relative to said base means and for movement between first contracted positions and second expanded positions, said movement of said mold elements being at least in part radial and at least in part axial, said segments comprising a first group of segments and a second group of segments, said segments being disposed to combine when in said expanded positions to form a generally continuous ring for defining a generally continuous internal annular groove in the molded part, said first group of segments configured to be movable radially inwardly from said expanded positions relative to said second group of segments sufficiently to be withdrawn from said annular groove, said first group of segments being movable axially relative to said second group of segments from said withdrawn positions and which axial movement of said first segments begins approximately when or without substantial delay after said first group of segments have been fully withdrawn from said annular groove, but not prior to said first group of segments having been fully withdrawn from said annular groove and thereby permit radially inward movement of said second group of segments from said expanded positions only after said first group of segments have been fully withdrawn from said annular groove and have started axial movement relative to said second group of segments, and which second segments then start axial movement with said base means relative to said outer mold surface, and
c. actuator means between said base means and said segments for effecting movement of said segments between said expanded and contracted positions incident to movement of at least a portion of said base means.

3,966,386

MACHINES FOR ROTATIONAL MOULDING OF PLASTIC ARTICLES WITH ARTICLE REMOVAL MEANS

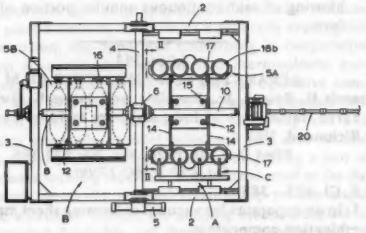
Knut Beyer-Olsen, Norvegjerde, and Otto Steffenssen, Nova Store-Norve, both of 6000 Alesund, Norway

Filed Dec. 16, 1974, Ser. No. 533,088

Claims priority, application Norway, Dec. 14, 1973, 4792/73

Int. Cl.² B29C *5/04;* B28B *7/10*

U.S. Cl. 425—436 R **9 Claims**



1. In a rotational moulding machine of the type including at least one two-part mould, each of the mould parts being mounted on separate rotatable shafts, means for simultaneously moving the mould parts of each mould from a closed moulding position wherein said mould parts are in contact, away from each other to an open moulded product release position wherein said mould parts are spaced from each other, and the split plane between said mould parts when in said closed moulding position being normal to the axis of said separate rotatable shafts; the improvement comprising means

for automatically removing a moulded product from said mould, said removing means comprising:

at least one pair of complementary product grasping means positionable to straddle said mould adjacent said split plane when said mould parts are in said closed moulding position;

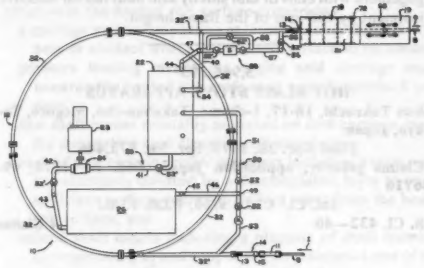
means for moving said product grasping means toward each other, into contact with a moulded product in said mould, as soon as said mould part moving means moves said mould parts from said closed moulding position by a sufficient distance to allow entry of said product grasping means, for thereby grasping and holding said moulded product prior to further separating movement of said mould parts, and for thus releasing said moulded product from said mould parts upon further separating movement of said mould parts; and

support means, supporting said product grasping means, for moving said product grasping means from the position straddling said mould to a discharge position outside said moulding machine for discharge of said moulded product, and vice versa.

3,966,387
APPARATUS FOR VULCANIZING HOSE

William R. Babbin, and Stephen C. Sabo, both of Barberton, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed June 5, 1975, Ser. No. 584,056
Int. Cl.² B29D *23/00*; B29H *7/14*
U.S. Cl. 425—445 **6 Claims**



1. Apparatus for vulcanizing elastomeric hose comprising:

A. a vulcanizing chamber of substantially circular cross-section extending helically about a vertical axis, said chamber having

1. an entrance end;
2. an exit end;

B. means circulating fluid at selected elevated temperature and pressure through the chamber from adjacent the entrance end to the exit end;

C. fluid recovery means adjacent the exit end of the chamber;

D. means for recycling fluid recovered by the recovery means to the fluid circulating means;

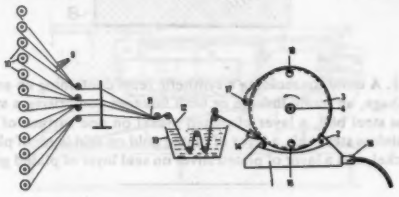
E. sealing means at the entrance end of the chamber for

1. permitting unvulcanized hose to enter the chamber through the entrance end for transport through the chamber by the circulating fluid and
2. preventing fluid from leaving the chamber through the entrance end while the hose is entering the chamber, the sealing means comprising
   a. an annular rigid cap member having a nose portion providing an elongated hose receiving and stiffening zone adjacent the entrance end, and
   b. a flexible, polymeric seal member having
      i. an annular mounting flange secured between said cap member and said entrance end, and
      ii. an annular portion extending into the chamber from the entrance end, terminating in a hose contacting lip, and having a surface exposed to the pressurized fluid in the chamber and a contour adapted to utilize the pressure of the fluid to promote sealing contact between the lip and hose.

3,966,388
DEVICE FOR CONTINUOUSLY MANUFACTURING CURVED PROFILED MEMBERS OF PLASTIC MATERIAL REINFORCED WITH FILAMENTS

Gerard Bonavent, Rueil-Malmaison; Michel Huvey, Bougival, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Aug. 19, 1975, Ser. No. 605,887
Claims priority, application France, Sept. 4, 1974, 30241
Int. Cl² B29G *7/00*
U.S. Cl. 425—505 **7 Claims**

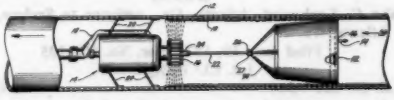


1. A device for continuously manufacturing a curved profiled member of plastic material reinforced with filaments, comprising a frame, a die formed of two complementary elements the first of which is secured to the frame and the other is rotatably mounted on said frame and connected to rotation driving means, at least one of said elements being provided with a groove which, together with the other element, forms a section of passage for a resin-impregnated assembly of filaments through the die, means for heating said first die for polymerization of the plastic material therein, means for continuously measuring the braking torque developed by the profiled member within the die during its formation, and means for automatically controlling the rotation speed of said driving means, said control means being connected to said measuring means and adapted to produce in response to a variation of the resisting torque, a corresponding variation of the rotation speed of the same direction as the torque variation.

3,966,389
APPARATUS FOR TROWELING PIPE LINING MATERIAL

Albert Shubert, Santa Ana, Calif., assignor to Ameron, Inc., Monterey Park, Calif.

Filed Dec. 27, 1972, Ser. No. 318,895
Int. Cl.² B05C *3/02*
U.S. Cl. 425—460 **1 Claim**



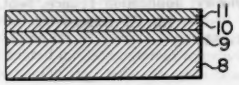
1. An improved frusto-conical trowel for spreading a smooth layer of protective coating material on the inside of a pipe, the trowel comprising a plurality of circumferentially overlapping arcuate leaves, an inflatable annular elastic tube member disposed within the trowel adjacent its larger end to bear against the leaves and urge them outwardly with a substantially uniform force against the protective coating material, the annular tube having a major diameter substantially greater than its minor diameter, and a plurality of longitudinally extending rods each secured at one end to the tube and at the other end to a portion of the trowel of smaller diameter.

3,966,390

MOLD FOR POLYIMIDE, POLYAMIDE, OR POLYAMIDE-IMIDE RESIN WHICH HAS NOBLE METAL LAYER ON ITS SURFACE TO BE IN CONTACT WITH RESIN

Mineo Nakano; Takeshi Koyama, both of Hitachi; Yoshiro Matsumoto, Ibaragi, and Akira Maruoka, Hitachi, all of Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed Aug. 21, 1973, Ser. No. 389,659
Int. Cl.² B29C *1/02*, *1/04*
U.S. Cl. 425—470 1 Claim



1. A mold for molding a synthetic resin containing an amide linkage, an imide linkage or both linkages comprising a stainless steel belt, a layer of plated nickel on one surface of said stainless steel belt, a layer of plated gold on said layer of plated nickel, and a layer of plated silver on said layer of plated gold.

3,966,391

METHOD OF COMBUSTION USING HIGH TEMPERATURE STABLE CATALYSTS

Saul G. Hindin, Mendham, and George R. Pond, Elizabeth, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Filed Dec. 10, 1973, Ser. No. 423,093
Int. Cl.² F23D *3/40*; F23B *7/00*
U.S. Cl. 431—7 4 Claims

1. A method for the combustion of carbonaceous fuel comprising: forming an intimate admixture of said fuel and air; contacting said fuel air admixture with an oxidation catalyst at a temperature sufficient to combust said admixture, said catalyst having a surface area of at least 20 m^2/g after calcination for two hours at a temperature of 1200°C., said catalyst consisting essentially of (a) a catalystically-active calcined composite of alumina, a rare earth metal oxide, and a mixture of two metal oxide components wherein the first component is selected from the group consisting of an oxide of Cr, W, and mixtures thereof and the second component is selected from the group consisting of an oxide of calcium, strontium, barium, silicon, tin, and mixtures thereof, and (b) a catalytically-effective amount of platinum group metal incorporated therein after calcination of said composite at a temperature of at least 500°C.

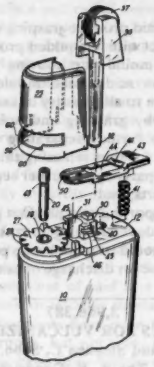
3,966,392

CIGARETTE LIGHTER HAVING IMPROVED VALVE MEANS

John C. Lockwood, Atlanta, Ga., assignor to Scripto, Inc., Atlanta, Ga.

Filed Aug. 19, 1974, Ser. No. 498,305
Int. Cl.² F23Q *2/16*
U.S. Cl. 431—344 6 Claims

1. A cigarette lighter having a body defining a fuel reservoir and a passageway extending from the reservoir to the body exterior; a rotatable spindle having a central bore therethrough threaded at least partially into said passageway; a windguard secured to the upper portion of said body and having a horizontal opening in its forward end with a slot in the lower portion thereof; a plurality of bendable tabs secured about said spindle exteriorly of said body and extending in a common plane except for one downwardly bent tab and extending through said windguard opening; a porous washer positioned at the inner end of said central bore, said spindle being rotated upon assembly to a point where the desired minimum compression of said porous washer is achieved where the tab adjacent one end of the slot is bent downward to restrict the withdrawal rotation of said spindle and stop



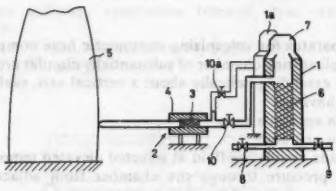
means for limiting rotary movement of said spindle through engagement with ends of said slot by said bent tab for selective adjustment by the user of the flame height.

3,966,393

HOT BLAST STOVE APPARATUS

Kikuo Takeuchi, 18-17, 1-chome, Takaban-cho, Meguro, Tokyo, Japan

Filed Apr. 28, 1975, Ser. No. 572,446
Claims priority, application Japan, Dec. 23, 1974, 49-146716
Int. Cl.² C21B *9/10*; F23L *15/02*
U.S. Cl. 432—40 4 Claims



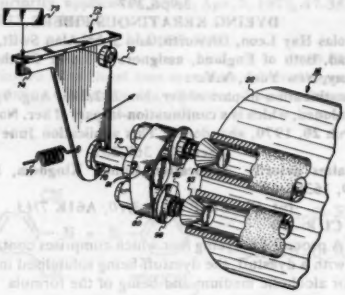
1. A hot blast stove apparatus comprising a regenerative hot blast stove, combustion heating means in said stove, heat regenerative material in said stove for being heated by said heating means, said stove having an outlet for discharge of hot blast gases from the stove, a main hot blast gas duct externally connected to said outlet for conveying hot blast gases from said stove, valve means for cyclical discharge of hot blast gases from said stove to said duct and temperature equalizer means in said main duct for absorbing heat from the hot blast gases at the beginning of a discharge cycle of the hot blast gases from the stove to store the heat and for releasing the stored heat to the hot blast gases at the end of the discharge cycle such that the hot blast gases are delivered from said duct at an equalized temperature during said cycle, said temperature equalizer means comprising a tubular container coupled to said duct, and a mass of heat regenerative material including juxtaposed checker brick with through holes therein filling said tubular container and through which the blast gases pass.

3,966,394

PLURAL CLEANING ROLLS ASSEMBLY

Oskar J. Braun, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 30, 1975, Ser. No. 572,986
Int. Cl.² G03G *13/20*
U.S. Cl. 432—75 4 Claims



1. In a fusing system for fusing toner images in an electrostatic copying machine in which a relatively hard heated roll surface is used to fix the toner images to copy sheet material, an improved plural cleaning rolls apparatus for cleaning toner offset onto the heated roll surface comprising:

a carriage means supporting at least two cleaning roll members in contact with a heated roll surface to be cleaned,

pressure loading means for urging said carriage means towards the heated roll surface at a predetermined pressure,

first shaft means rotatably mounted on said carriage means for supporting said cleaning roll members,

each of said cleaning roller members including a core member exteriorly covered by a thermoplastic layer to create sufficient surface energy to collect toner from the heated roll surface, and

second shaft means including a plurality of shaft members corresponding to and supporting an associated one of said core members for rotation thereof, and

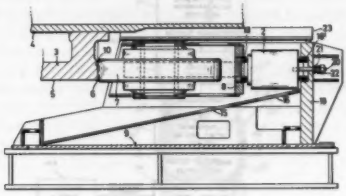
flexure means connecting said first shaft means to each of said shaft members whereby independent alignment of said shaft members and core members relative to the fuser roll is accomplished.

3,966,395

PRESSURE ROLLER STAND FOR FORCIBLE LONGITUDINAL DISPLACEMENT OF LARGE ROTATING DRUMS

Heinrich Schneider, Bochum, and Ernst Böser, Solingen, both of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Nov. 8, 1974, Ser. No. 522,146
Claims priority, application Germany, Nov. 9, 1973, 2356038
Int. Cl.² F27B *7/00*; F16C *13/00*
U.S. Cl. 432—103 15 Claims



15. A pressure roller stand with a drive means for forcing longitudinal displacement of a heavy industrial drum rotating on annular raceways adjacent a foundation, comprising:

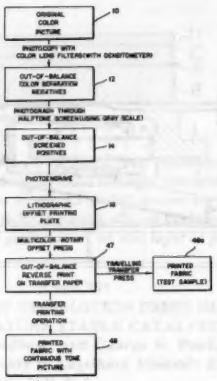
a pressure roller rotatable on an axis transverse to the axis of said heavy drum for engagement with an axially facing surface on one of said annular raceways of the drum; and

a drive means connected to said pressure roller for applying a force thereto transverse of its axis of rotation forcing said roller against the raceway, said drive means connected to the roller to apply a force transverse of the roller axis and through the axial center of its axis and in alignment with the reaction force between the roller and raceway so that lateral force couples are absent which would create wear on the roller, and wherein said drive means is connected to the pressure roller by a displaceable ring central to said pressure roller and on which said pressure roller rotates.

3,966,396
TEXTILE PRINTING PROCESS AND TRANSFER MEDIUM

Bruce Howes, South Salem, N.Y., and Thomas K. Holland, Paris, France, assignors to F. P. Licensing Co., Inc, New York, N.Y.

Filed Dec. 18, 1974, Ser. No. 533,862
Int. Cl.² D06P *1/00*; B32B *9/06*; B41M *3/12*; G03F *7/02*
U.S. Cl. 8—2.5 A **16 Claims**



1. An offset process for multiple color printing in ink dyes of an original pattern to a true likeness comprising the steps of:

copying the pattern photographically through color filter lenses to produce separate negatives in each of the respective colors desired,

regulating exposure and developing variables for the separate negatives to achieve selected film emulsion densities on the respective negatives, said densities being reduced from a standard balanced negative to define an out-of-balance negative,

projecting the out-of-balance negatives through a halftone screen for uniformly dividing the pattern into a plurality of dots corresponding in sizes to the intensity of light transmission through the film emulsion to form respective halftone positive dot patterns reduced in size in proportion to the respective ink transfer sublimation characteristics,

photoengraving each of the halftone positive dot patterns respectively on a corresponding lithographic plate,

printing the dot patterns respectively on a transfer medium corresponding to that on the lithograph plates by depositing ink dyes in the respective colors from each of the plates,

transferring the dot pattern from the transfer medium onto a fabric through the application of heat and pressure to form a continuous tone pattern.

12. A method of textile printing suitable for producing a design formation on a fabric comprising the steps of photoengraving printing plates using an ink dot pattern produced from color compensated halftone positives and having a dot structure reduced in size in proportion to ink transfer sublimation characteristics, applying controlled quantities of ink on the printing plates and dot pattern, transposing the inked dot pattern from the printing plates onto a support medium and then heat transferring the dye from the inked dot pattern in a vapor phase from the support medium onto a fabric whereby the ink dye from the ink dots expand to form a continuous tone pattern.

3,966,397
DYEING KERATINOUS FIBERS

Nicholas Hay Leon, Isleworth, and John Alan Swift, Maidenhead, both of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 282,196, Aug. 9, 1972, abandoned, which is a continuation-in-part of Ser. No. 21,498, March 20, 1970, abandoned. This application June 5, 1973, Ser. No. 367,282
Claims priority, application United Kingdom, Mar. 28, 1969, 16383/69
Int. Cl.² D06P *1/38, 3/10*; A61K *7/13*
U.S. Cl. 8—10 **9 Claims**

1. A process for dyeing hair which comprises contacting the hair with a dyestuff, the dyestuff being solubilised in an aqueous or alcoholic medium and being of the formula

$$R^2\text{—}(N{=}N\text{—}Y\text{—}\overset{\overset{S}{\|}}{C}\text{—}SR)_n$$

wherein

R is selected from the group consisting of

- R′COOH
- -R′COOCH$_3$
- CH$_2$CH$_2$OH

and,

- CH$_3$

in which R′ is an alkylene group containing 1, 2 or 3 carbon atoms,

R² is the residue of a diazo coupling compound,

Y is a phenylene or substituted phenylene group and

n is 1 or 2.

3,966,398
HAIR DYEING COMPOSITION CONTAINING A NON-IONIC SURFACTANT

Guy Vanlerberghe, Rue Des Ecoles, and Henri Sebag, Paris, both of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 384,635, Aug. 1, 1973, Pat. No. 3,928,224, which is a continuation-in-part of Ser. No. 142,409, May 11, 1971, Pat. No. 3,821,372. This application Mar. 24, 1975, Ser. No. 561,630
Claims priority, application Luxemburg, May 12, 1970, 60900
Int. Cl.² D06P *3/06*
U.S. Cl. 8—11 **1 Claim**

1. An aqueous hair dyeing composition comprising an effective amount of a hair dye and as a thickener or dye vehicle therefor a compound of the formula

$$R\text{-}CHOH\text{-}CH_2O\text{-}\left[CH_2\text{-}CHOH\text{-}CH_2\text{-}O\right]_n H$$

wherein R is selected from the group consisting of aliphatic, cycloaliphatic and arylaliphatic radicals and mixtures thereof, having 7–21 carbon atoms, wherein the aliphatic moiety of said radicals is saturated or unsaturated, linear or branched and optionally contains 1 to 6 ether, thioether and hydroxymethylene groups, *n* is greater than 1 and equal to or less than 10, in a proportion of 1 to 80% by weight of said composition.

3,966,399

AZO DISPERSE DYE MIXTURES

Katsunobu Sato, Minoo; Yoshihisa Sueda, Toyonaka; Yoshiro Izutsutani, Osaka; Kunihiko Imada, Toyonaka, and Katsumasa Ohtake, Nara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

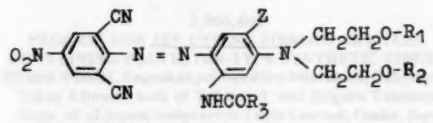
Filed Apr. 9, 1973, Ser. No. 349,578

Claims priority, application Japan, Apr. 7, 1972, 47-35325; Apr. 7, 1972, 47-35326

Int. Cl.² D06P *1/18*

U.S. Cl. 8—26 10 Claims

1. A mixture of at least two members selected from the group consisting of compounds represented by the formula,



wherein Z represents hydrogen atom or methyl, ethyl, methoxy or ethoxy group, each R_1 and R_2 represents methyl or ethyl group, R_3 represents methyl, ethyl or phenyl group or a phenyl group substituted by methyl, ethyl, methoxy or ethoxy group.

3,966,400

PROCESS AND DEVICE FOR THE IRREGULAR DYEING OF TEXTILES

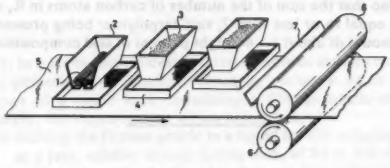
Walter Birke; Hans-Ulrich von der Eltz, and Franz Schön, all of Frankfurt am Main, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 22, 1974, Ser. No. 499,401

Claims priority, application Germany, Aug. 25, 1973, 2342981

Int. Cl.² C09B *67/00;* D06C *23/00;* D06P *5/02*

U.S. Cl. 8—82 6 Claims



1. A process for the irregular dyeing of textile material, which comprises: applying a mixture of dyestuffs and salts containing crystal water in powder form irregularly onto the material and melting the salt by means of a heat treatment sufficient to melt and release water from said salts, the bondage between the dyestuffs and the material to be dyed being brought about by means of the liquid phase which forms thereby; and then finishing the dyeing in the usual manner according to known methods for the fixation of the dyestuffs used.

3,966,401

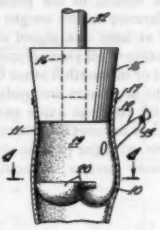
PREPARING NATURAL TISSUE FOR IMPLANTATION SO AS TO PROVIDE IMPROVED FLEXIBILITY

Warren D. Hancock, Santa Ana, and Thomas J. Fogarty, Palo Alto, both of Calif., assignors to Hancock Laboratories Incorporated, Anaheim, Calif.

Filed July 1, 1974, Ser. No. 485,159

Int. Cl.² A61L *17/00;* A63B *51/02;* D01C *3/00;* D01F *5/00*

U.S. Cl. 8—94.11 13 Claims



1. The method of preparing for implantation natural tissues in a form in which a portion thereof is subjected to pressure within the physiologic range when implanted and which assumes a predetermined configuration as a result of such pressure comprising the steps of

alternately applying a tanning fluid to said portion of said tissues at a pressure within the physiologic range, and relieving the pressure on said portion of said tissues to less than that of said physiologic range,

whereby said portion of said tissues is caused to assume said predetermined configuration intermittently,

and simultaneously applying a tanning fluid to remaining parts of said tissues at a pressure below said physiologic range so as to cause said portion and said remaining parts of said tissues to become fixed while said portion of said tissues intermittently assumes said predetermined configuration.

13. The method of preparing a natural heart valve for implantation comprising the steps of

inserting a member having an aperture therethrough into the ascending aorta of a unit that includes a natural heart valve and its ascending aorta,

attaching said aorta to said member so that said unit and said member define a chamber and said aperture provides access to the interior of said chamber at the downstream end of said valve.

ligating the arteries of said unit so as to close said chamber,

alternately introducing a tanning fluid which is pressurized to within the physiologic range of pressure for said valve through said aperture into said chamber so as to inflate said valve and cause said valve to assume substantially its natural configuration, and relieving the pressure of such tanning fluid,

thereby to cause intermittent flexing of said valve, simultaneously applying such tanning fluid at a pressure below said physiologic range of pressure to the exterior of said unit while said valve is so intermittently flexed,

and maintaining said tanning fluid so applied to the exterior of said unit and continuing to so alternately introducing tanning fluid into said chamber and relieving the pressure thereof for a time sufficient to cause the tissue of said valve to become substantially fixed, thereby to cause said valve to substantially maintain said configuration while possessing flexibility.

3,966,402

PROCESS FOR THE MANUFACTURE OF BASIC CHROME TANNING AGENTS SOLUBLE IN COLDWATER

Hans-Joachim Nebel, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 5, 1974, Ser. No. 486,239

Claims priority, application Germany, July 7, 1973, 2334636

Int. Cl.² C14C *3/06*; B01F *1/00*

U.S. Cl. 8—94.27 10 Claims

1. A process for the manufacture of a powdered, basic chromium sulfate which is soluble in cold water, said process comprising the step of evaporating an aqueous solution of basic chromium sulfate in the presence of 0.1 to 10% by weight, with reference to the weight of dry chromium salt in the solution, of at least one glycol compound selected from the group consisting of alkylene glycol of 2 to 4 carbon atoms; the monomethyl or monoethyl ether of said glycol; and higher molecular weight oligomers and polymers of said glycol, adducts thereof with ethylene oxide and/or propylene oxide, or the monomethyl or monoethyl ethers of said oligomers, polymers and adducts, with the proviso that said higher molecular weight compounds have a molecular weight up to about 2,500.

3,966,403

HAIR LACQUER OR HAIR SETTING COMPOSITION CONTAINING A TETRAPOLYMER

Christos Papantoniou, Epinay-sur-Seine, and Jean-Claude Grognet, Gagny, both of France, assignors to L'Oreal, Paris, France

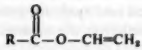
Filed Mar. 31, 1975, Ser. No. 563,460

Claims priority, application Luxemburg, Apr. 1, 1974, 69759

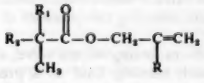
Int. Cl.² A61K *7/06*

U.S. Cl. 8—127.51 3 Claims

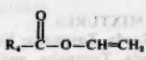
1. A hair lacquer composition or a hair setting composition comprising a hydroalcoholic carrier or an alcoholic carrier and a copolymer of 2–15 weight percent of an unsaturated acid having the formula $R-CH=CH-(CH_2-O-CH_2)_n-COOH$ wherein $n=0$ or 1 and when $n=0$, $R=CH_3$ and when $n=1$, $R=H$; 55–89.5 weight percent of a vinyl ester having the formula



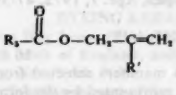
wherein R is CH_3 or C_2H_5; 8–20 weight percent of at least one branched allyl or methallyl ester having the formula



wherein R′ represents hydrogen or CH_3, R_1 represents a saturated hydrocarbon chain, linear or branched, having 1–6 carbon atoms and R_2 represents CH_3 or $CH(CH_3)_2$, with the proviso that the sum of the number of the carbon atoms in R_1+R_2 is equal to or less than 7; and 0.5–10 weight percent of a monomer selected from the group consisting of a vinyl ether having the formula $CH_2=CH-O-R_3$ wherein R_3 is linear or branched alkyl having 1–12 carbon atoms, a vinyl ester having a fatty chain and having the formula



wherein R_4 is linear alkyl having 7–11 carbon atoms and a linear allyl or methallyl ester having the formula



wherein R′ is hydrogen or CH_3 and R_5 is linear alkyl having 1–11 carbon atoms, said copolymer being present in an amount of about 1–4 weight percent of said composition.

3,966,404

HAIR LAQUER OR HAIR SETTING COMPOSITION CONTAINING A TERPOLYMER

Christos Papantoniou, Epinay-sur-Seine, and Jean-Claude Grognet, Gagny, both of France, assignors to L'Oreal, Paris, France

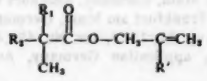
Filed Mar. 31, 1975, Ser. No. 563,461

Claims priority, application Luxemburg, Apr. 1, 1974, 69760

Int. Cl.² A61K *7/06*

U.S. Cl. 8—127.51 3 Claims

1. A hair lacquer composition or hair setting composition comprising a hydroalcoholic carrier or an alcoholic carrier and a terpolymer of 6-15 weight percent crotonic acid, 65–86 weight percent vinyl acetate and 8–20 weight percent of an allyl or methallyl ester of the formula



wherein R′ is selected from the group consisting of hydrogen and $-CH_3$, R_1 is a saturated hydrocarbon chain, linear or branched, having 1–6 carbon atoms, and R_2 is selected from the group consisting of $-CH_3$ and $-CH(CH_3)_2$, with the proviso that the sum of the number of carbon atoms in R_1 and R_2 is equal to or less than 7, said terpolymer being present in an amount of about 1—4 weight percent of said composition.

3,966,405

N-ALKYL NITRO PHENYL DIETHYLENE TRIAMINE DYEING OF ACID MODIFIED SYNTHETIC FIBERS

Reinhard Mohr, Offenbach am Main, and Manfred Hahnke, Kelkheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

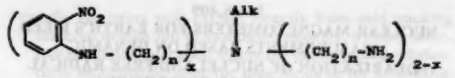
Filed Mar. 17, 1975, Ser. No. 558,783

Claims priority, application Germany, Dec. 17, 1974, 2459564

Int. Cl.² D06P *5/00*

U.S. Cl. 8—168 A 8 Claims

1. In a process for the dyeing of high-molecular substrates containing acidic groups with basic nitro groups containing dyestuffs the improvement consisting of contacting said substrate with a dyestuff of the formula



wherein Alk is alkyl of 1 to 6 carbon atoms, *n* is 2 to 6, *x* is a number of 1 up to but excluding 2 and wherein the phenyl nuclei can be substituted by halogen, carboalkoxy of 2 to 5 carbon atoms, nitro, sulfamoyl, sulfon amide mono- or di-(lower alkyl)-amide, carbamoyl, carboxylic acid mono- or di-(lower alkyl)-amide, cyano, lower alkyl, lower alkoxy, lower alkanoylamino or lower alkylsulfonyl, or a mixture of said dyestuffs.

3,966,406

PROCESS FOR JET DYEING FIBROUS ARTICLES CONTAINING POLYESTER-TYPE SYNTHETIC FIBERS

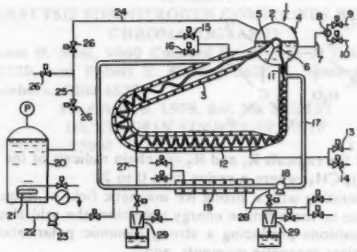
Hiroshi Namiki, Nagaokakyo; Norihiro Minemura, Takatsuki; Takeo Kimura, both of Takatsuki, and Shigeru Takahashi, Kaga, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Sept. 4, 1974, Ser. No. 503,190

Claims priority, application Japan, Sept. 5, 1973, 48-99163; Sept. 18, 1973, 48-104503

Int. Cl.[2] D06P *3/52*

U.S. Cl. 8—179 **14 Claims**



1. In a jet dyeing process for dyeing fibrous articles containing polyester-type synthetic fibers by adding a jet of a dye liquor to a liquid bath containing a fibrous article moving therein, the improvement which comprises,

a. moving the fibrous article in a liquid bath in a dyeing tank at a rate, relative to said dyeing tank, of 80 to 300 meters per minute while the liquid bath is at a temperature of no more than 80°C. and does not contain any dye,

b. elevating the temperature of the liquid bath in the dyeing tank to at least 110°C., while the fibrous article is moving therein, and

c. adding a dye liquor containing dye in an amount of 1 gram per liter to 100 grams per liter to said liquid bath at a rate of not more than 20 liters per second after the temperature of said liquid bath reaches at least 100°C. to form a dye bath in said dyeing tank of at least 110°C., said dye bath having a dye concentration of 0.001 to 5% based on the weight of the fibrous article in said dye bath, while continuing to move said fibrous article in said dye bath at said rate of 80 to 300 meters per minute, relative to said dyeing tank until said fibrous article is dyed.

3,966,407

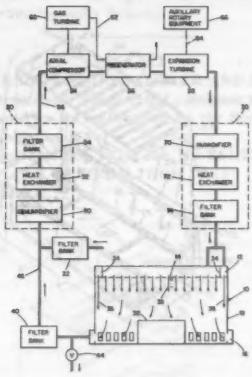
AIR STERILIZING COMPRESSOR SYSTEM

Harry Zuckerberg, 60 Browne St., and William Kukers, 86 Griggs Road, both of Brookline, Mass. 02146

Filed Aug. 2, 1974, Ser. No. 494,168

Int. Cl.[2] A61L *3/00*; F24F *13/00*

U.S. Cl. 21—74 R **16 Claims**



1. An air processing system for use with a medical service facility that has an inlet passage for flow of air into the facility and an outlet pressure for flow of air out of the facility,

said air processing system having a flow capacity sufficient to provide at least two hundred changes of air per hour in the serviced medical service facility and comprising

closed path structure having an inlet port for connection to the outlet passage of the serviced medical service facility and an outlet port for connection to the inlet passage of the serviced medical facility, said closed path structure defining a closed air flow path between said inlet port and said outlet port,

a compressor in said closed path, said compressor imparting flow energy to the air in said closed path and simultaneously raising the temperature of the air in said closed path at least 300°F, said compressor having an inlet connected to said inlet port and an outlet through which heated air flows from said compressor,

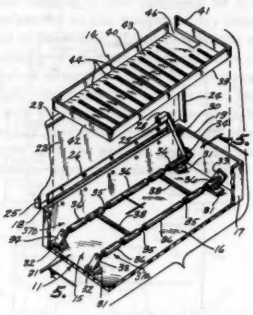
an air temperature retaining unit in said closed path, said air temperature retaining unit having an inlet connected directly to the outlet of said compressor, an air passageway arrangement for maintaining the heated air from said compressor at sterilizing temperature for a sufficient time interval for achieving substantially complete sterilization, and an outlet through which sterilized air flows from said air temperature retaining unit, and

an expansion device in said closed path, said expansion device having an inlet through which the sterilized air from said air temperature retaining unit is passed and an outlet connected to said outlet port, said expansion device reducing the temperature of the sterilized air from said air temperature retaining unit prior to flow of that air through said closed path outlet port for flow into the serviced medical service facility.

3,966,408
STERILANT IMMERSION CONTAINER WITH COVER ACTUATED TRAY

Richard E. Drennen, Fairway Heights, and Keith L. Stutzman, 19 N. Seventh, both of Denison, Iowa 51442

Filed Feb. 13, 1975, Ser. No. 549,503
Int. Cl.² A61L 3/00, 3/02; A47B 81/00
U.S. Cl. 21—87 6 Claims



1. For effecting the sterilization of instruments in a chemical germicide solution, a sterilizer unit comprising:

a container member having a bottom and walls, said walls being joined in end to end fashion and being perpendicularly attached to said bottom, said walls forming an opening, the germicide solution being received through said opeing and held by said walls and said bottom;

a cover member pivotally attached to said container and movable to close said opening of said container;

a removable tray member having a wide slot and a plurality of narrow slots formed therethrough, said wide slot and said narrow slots being disposed in parallel with respect to each other, the instruments being received and held by said tray;

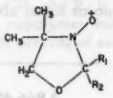
means for supporting, rocking and moving said tray between a first position adjacent said bottom and a second position adjacent said opening, said tray being supported in a horizontally disposed manner at both said first and said second positions, said tray being immersed in the germicide solution at said first position and being elevated above the germicide solution at said second position, the germicide solution draining from said tray through said wide and narrow slots into said container when said tray is in said second position, said tray being rocked through dispositions at an angle to the horizontal while between said first and said second positions, said means for supporting, rocking and moving including first and second pivot support units and at least one cross member, both of said pivot support units being pivotally attached to said bottom of said container, said cross member interconnecting said pivot support units, said tray resting upon said pivot support units; and

means connecting said cover member and said means for supporting, rocking and moving, for moving said means for supporting, rocking and moving in response to movement of said cover member, said connecting means for moving being received within said wide slot.

3,966,409
NUCLEAR MAGNETOMETERS FOR EARTH'S FIELD MEASUREMENTS BASED ON DYNAMIC POLARIZATION OF NUCLEI AND FREE RADICAL SUBSTANCE FOR USE THEREIN

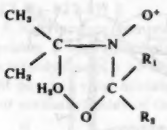
Ivan Hrvoic, 2825 Islington Ave., N., Weston, Ontario, Canada, and Kresimir Humski, Adamiceva 3, 41020 Zagreb, Yugoslavia

Filed Sept. 9, 1974, Ser. No. 504,719
Claims priority, application Canada, Nov. 30, 1973, 187093
Int. Cl.² C07D 263/00; G01N 27/26
U.S. Cl. 23—230 R 4 Claims



1. A method of measuring weak magnetic fields comprising:

a. placing in the magnetic field to be measured, a sample of a chemical substance made up of an assembly of nuclei with magnetic moments different from zero, the transition energy between the two adjacent energy states of nuclear magnetic moments being strictly proportional to the applied magnetic field and an assembly of unpaired electrons with unpaired spin and magnetic moments, said nuclear and electron magnetic moments being coupled by dipolar or scalar coupling or both, the said unpaired electrons in the sample being provided by a free radical chemical substance of the oxazolidine group



wherein the radicals R_1 and R_2 are chain radicals of the type $-(CH_2)_n CH_3$, where n varies from 0 to 2,

b. saturating with a strong RF magnetic field of frequency close to the electron energy transition, the said electron transitions producing a strong dynamic polarization of nuclear magnetic moments, and

c. detecting and measuring by electrical means the transition energy states of nuclear moments.

3,966,410
GROUP EXTRACTION OF ORGANIC COMPOUNDS PRESENT IN LIQUID SAMPLES

Vilhelm J. Jahnsen, Lake View Terrace, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 274,321, July 24, 1972, abandoned. This application June 20, 1974, Ser. No. 481,065
Int. Cl.² B01D 15/00, 15/08
U.S. Cl. 23—230 B 10 Claims

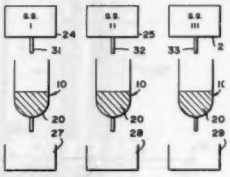
1. A method of extracting from a liquid sample, consisting of an aqueous liquid in which chemical compounds are contained, an extract, comprising a selected family of said compounds, the steps comprising

providng a substantially hollow tube with inlet and outlet openings and a packing zone therebetween,

placing a dry, substantially inert, chemically non-reactive packing material which has a large surface area to volume ratio within said packing zone,

directing through said open inlet to said packing material said liquid sample, whereby as it comes in contact with said packing material it spreads out as a thin liquid film over the large surface area of said packing material and is held thereon in a stationary state, and

rapidly removing said extract directly from said packing material in bulk out of said outlet opening, without selective fractional migration within the packing zone substantially immediately after the time required for an organic solvent, which is immiscible with the liquid of said sample, to pass through said packing material which is holding said sample as a thin liquid film spread over its large surface area,



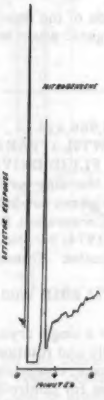
said step of rapidly removing said extract comprising passing a reagent through said packing material to adjust the pH of said extract in said liquid sample to provide said extract with a partition coefficient value biased very heavily in favor of a solvent, which is immiscible with the liquid of said sample, relative to said sample,

passing said solvent, which is immiscible with the liquid of said sample through said packing material, in bulk through said packing material whereby it will exit said outlet opening carrying said extract therewith.

3,966,411
ANALYSIS FOR NITROGEN COMPOUNDS BY GAS CHROMATOGRAPHY

William D. Ross, 9060 Concord Road, R.R. 3, Eaton, Ohio 45320, and Robert E. Sievers, 2628 N. Emerald Drive, Fairborn, Ohio 45324

Filed Apr. 8, 1975, Ser. No. 566,157
Int. Cl.² G01N *31/08*, *31/10*, *33/18*
U.S. Cl. 23—230 R **19 Claims**



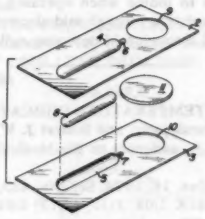
1. A process for the quantitative analysis of nitrogen-containing compounds which comprises mixing a sample comprising a nitrogen-containing compound selected from the group consisting of nitric acid, a salt of nitric acid, the oxidation products of an organic nitrogen-containing compound and nitrogen dioxide with an aromatic compound having the following formula:

where R is hydrogen, alkyl, alkoxy, hydroxy or amino; reacting with nitrogen-containing compound with the aromatic compound in the presence of sulfuric or sulfurous acid, thereby converting the nitrogen-containing compound to a nitro-aromatic compound; and passing a sample of the resulting reaction mixture containing the nitro-aromatic compound through a chromatography detector.

3,966,412
LEWISITE DETECTION SAMPLER AND METHOD

Howard L. Stroterhoff, Towson, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 25, 1975, Ser. No. 561,723
Int. Cl.² G01N *21/06*, *21/12*
U.S. Cl. 23—232 R **2 Claims**



1. A method of detecting chlorovinyldichlorarsine vapors in the surrounding atmosphere comprising the steps of placing a white silica gel paper spot and a frangible thin walled ampule containing a reactant solution consisting essentially of cupric carbonate, arsenious oxide, sodium hydroxide, piperidine in an aqueous solution of distilled water, in a recessed plastic film container means having an aperature means in both the upper and lower surfaces for exposing said silica gel paper spot to the atmosphere to be tested, exposing said silica gel paper spot to the atmosphere suspected to contain chlorovinyldichlorarsine, simultaneously crushing the reactant containing ampule to flow the reactant therein to the silica gel paper spot; reacting the reactant solution and any chlorovinyldichlorarsine absorbed in the silica gel paper spot to produce a color change in the white silica gel paper to a color spectrum of brownish-red to indicate the presence of chlorovinyldichlorarsine vapors in the tested atmosphere.

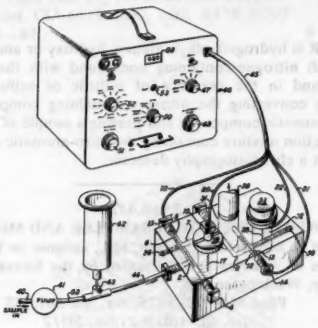
3,966,413
ELECTROCHEMICAL CHLORINE FLUX MONITOR

George Marinenko, Clarksburg, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Sept. 5, 1975, Ser. No. 610,711
Int. Cl.² G01N *27/46*, *27/52*
U.S. Cl. 23—253 R **6 Claims**

1. Apparatus for measuring low concentration levels of chlorine in water including a self-contained calibration means comprising, means for providing a sample of water, a container of potassium iodide solution, means for mixing said sample of water and said potassium iodide solution to form a new solution, said new solution containing an amount of iodine proportional to the concentration of the chlorine in said sample of water, amperometric detecting cell means having a reference electrode and a working electrode, means for pass-

ing said new solution between said electrodes of said detecting cell means, and means for measuring the electrical current output of said detecting cell means, said calibration means comprising electrolysis cell means situated upstream of said



detecting cell means for electrolyzing the potassium iodide in said new solution to iodine when operated, and means for passing said new solution through said electrolysis cell means before it is passed through said detecting cell means.

3,966,414

TIME TEMPERATURE INDICATORS

Ghazi Khattab, Parsippany, and Robert J. Witonsky, Princeton, both of N.J., assignors to Bio-Medical Sciences, Inc., Fairfield, N.J.

Filed Jan. 16, 1974, Ser. No. 433,925

Int. Cl.[2] G01K *3/04, 3/10, 11/12*; **G01N** *31/22*

U.S. Cl. 23—253 TP **5 Claims**

1. An indicator system operable to signal the attainment of a preselected value corresponding to the integral of the temperatures to which said system has been exposed as a function of time comprising:

a. a free radical sensitive dye;

b. at least a one molar excess based on said dye on an organic peroxide having the formula

$$R^1—O—O—R^1$$

wherein each of R^1 and R^2, independent of the other, is (I) a hydrocarbon group selected from the group consisting of alkyl, alkenyl, phenyl, phenylalkyl, cycloalkyl, phenoxyalkyl and substituted derivatives thereof or (II) said hydrocarbon group linked to the peroxy group through a carbonyl, oxycarbonyl or sulfonyl group; and

a solid, peroxide inert carrier; wherein a mixture of said free radical sensitive dye and organic peroxide is supported on said solid, peroxide inert carrier; whereby said dye changes color in the system as a result of free radical generation from the decomposition of said organic peroxide.

3,966,415

AEROBIC/ANAEROBIC COMPOSTING DEVICE

Francis B. Chester, 40-28 - 220th St., Bayside, N.Y. 11361

Continuation of Ser. No. 315,115, Dec. 14, 1972, Pat. No. 3,890,129. This application Mar. 24, 1975, Ser. No. 561,173

The portion of the term of this patent subsequent to June 17, 1992, has been disclaimed.

Int. Cl.[2] C05F *11/08, 11/06*

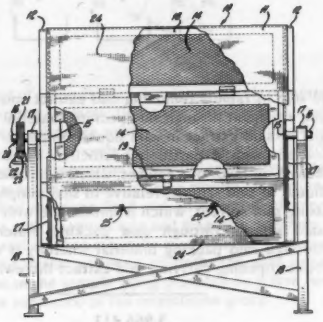
U.S. Cl. 23—259.1 **3 Claims**

1. In a composting device for aerobic and anaerobic decomposition of organic waste materials, the combination which comprises:

a. a rotatable waste material receptacle supported at ends thereof for rotation about a horizontal axis, said receptacle comprising a drum-like container having open sides;

b. open-mesh means extending around said open sides of said receptacle for discharging composted material from the receptacle in rotation of the receptacle about said horizontal axis;

c. cover means removably attached to and rotatable with said receptacle for retaining heat generated by decomposition of the waste material and protecting said waste material from moisture, said cover means comprising a removable cover of flexible material extending around said open-mesh sides of the receptacle and preventing the waste material from passing therethrough during rotation of the receptacle; and



d. an access door in a side of the receptacle for permitting introduction of the organic waste material therethrough into the receptacle.

3,966,416

SINGLE CRYSTAL GROWTH APPARATUS WITH FLUID BEARING AND FLUID DRIVE MEANS

Jean-Claude Tranchart, Morsang-sur-Orge, and Jacques Charles Louis Bunel, Vigneux-sur-Seine, both of France, assignors to U.S. Philips Corporation, Briarcliff Manor, N.Y.

Filed June 20, 1974, Ser. No. 481,381

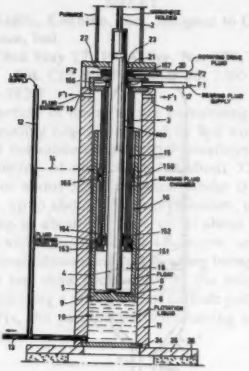
Claims priority, application France, June 28, 1973, 73.23686

Int. Cl.[2] B01D *9/00*

U.S. Cl. 23—273 SP **9 Claims**

1. In a driving device for a single crystal growth apparatus, for moving a body vertically and rotationally about a vertical axis through a growth furnace, comprising a tank for holding a quantity of liquid, means for controlling the level of said liquid in the tank, a hollow cylindrical float for floating in the liquid, having an inner bottom surface and an inner vertical wall having a given height, a circular cylindrical central member having a height greater than said given height, said central member positioned vertically, the improvement wherein said central member has a top portion arranged to carry said body and a bottom end disposed within said float, and said device further comprises bearing means for supporting said bottom end on said bottom surface, means for establishing a gas bear-

ing with said central member to center said member and maintain said member vertical, and means for directing a gas



flow in contact with said central member so as to rotate said member about a vertical axis.

3,966,417

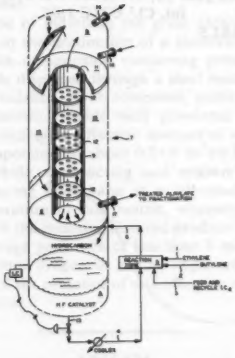
APPARATUS FOR CONTACTING ALKYLATE CONTAINING ALKYL FLUORIDE WITH HYDROGEN FLUORIDE

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 159,884, July 6, 1971, Pat. No. 3,784,628. This application Sept. 13, 1973, Ser. No. 397,028

Int. Cl.² B01J *1/00, 8/08;* **C07C** *3/54*

U.S. Cl. 23—283 **5 Claims**



1. An apparatus for the contacting of two liquids which comprises a unitary vessel containing a lower section, an intermediate section, and an upper section, the upper portion of said lower section being delineated by a plate extending across the vessel, a means in the upper portion of said lower section for introducing a liquid into said lower section, a means in the lower portion of said lower section for withdrawing a liquid from said lower section, an upright riser conduit mounted on said plate in cooperation with a perforation in said plate to permit liquids from said lower section to rise into said riser conduit, said plate being in fluidtight connection with the walls of said vessel and said riser conduit, said riser conduit containing mixing and contacting elements, said riser conduit extending upwardly from said plate a substantial distance along the vessel and defining with the vessel an annulus, a second plate having a perforation therein associated with said riser conduit to permit communication between the upper section and the lower section through said riser conduit, said second plate being in fluid-tight connection with the walls of said vessel and with the upper portion of said riser conduit, said second plate defining the upper portion of the intermediate section and the lower portion of said upper section means for introducing a liquid into said upper section at a lower portion thereof, and a downcomer conduit with one of its ends near the top of said vessel in said upper section, the other end of said downcomer conduit extending downwardly through said upper plate so that liquid in the top of said section can be passed downwardly through said downcomer into the annulus formed between the vessel and the riser conduit in the intermediate section of the vessel, and means provided for removing liquids in said annulus portion of the intermediate section from the vessel.

3,966,418

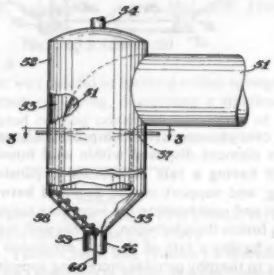
GAS TREATMENT APPARATUS

Ludo K. Frevel, Midland, and Leonard J. Kressley, Saginaw, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 433,935, Jan. 16, 1974, abandoned. This application Feb. 28, 1975, Ser. No. 553,958

Int. Cl.² C01B *17/56;* **B01D** *50/00;* **B01J** *1/00*

U.S. Cl. 23—284 **1 Claim**



1. A gas treatment apparatus comprising:

a hollow body having a gas exit port in the ceiling thereof and a conical funnel-shaped portion with a solids exit port in the bottom thereof;

a conduit for conveying gas, a portion of the conduit passing through a wall of and into the interior of the hollow body such that a portion of the conduit within the hollow body is aligned coaxially with the hollow body, the conduit having a first open end for introducing a gas to be treated into the hollow body and a second open end within the hollow body for discharging treated material from the hollow body;

at least one nozzle for injecting an atomized solution into the gas conveyed in the conduit, the nozzle being positioned in fluid communication with the interior of the conduit, and the nozzle being located at an angle relative to a radial from the center of the conduit, such that a swirling motion is imparted to the injected solution;

a gas passageway for removing gases formed during the gas treatment, the passageway being defined by the inner surface of the hollow body and the outer surface of the conduit portion, and the gas passageway being in communication with the gas exit port;

a screw conveyer positioned on the inner peripheral surface of the conical funnel-shaped portion of the hollow body;

means to support the screw conveyer on the inner peripheral surface;

a drive means adapted to rotate the screw conveyer about its axis while circularly swiveling the screw conveyer over substantially the entire inner peripheral surface of the conical funnel-shaped portion, such that any solids deposited thereon during gas treatment are removed through the soild exit port by the motion of the screw conveyer.

3,966,419

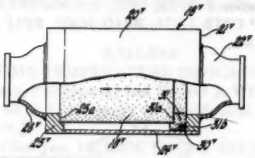
CATALYTIC CONVERTER HAVING MONOLITH WITH MICA SUPPORT MEANS THEREFOR

Rodger E. Bloomfield, Linden, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 18, 1974, Ser. No. 524,486

Int. Cl.² B01J *8/00*; F01N *3/15*, *7/00*

U.S. Cl. 23—288 F **7 Claims**



1. A catalytic converter comprising a housing, a monolithic catalyst element disposed within said housing, said catalyst element having a rate of thermal expansion less than said housing, and support means disposed between said catalyst element and said housing for providing supporting and immobilizing forces therebetween, said support means being formed of mica having a rate of thermal expansion greater than said housing to thereby provide increasing supporting and immobilizing forces between said catalyst element and said housing as the temperature of said converter increases.

3,966,420

APPARATUS AND PROCESS FOR THE CATALYTIC TREATMENT OF HYDROCARBONS

Abraham A. Pegels, and Joannes B. Wijffels, both of The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

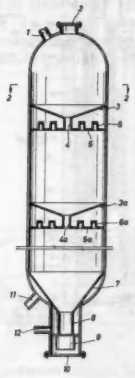
Filed Jan. 10, 1975, Ser. No. 540,307

Claims priority, application Netherlands, Feb. 8, 1974, 7401733

Int. Cl.² B01J *8/04*, *8/12*, *8/20*, *8/44*

U.S. Cl. 23—288 R **12 Claims**

1. An upright apparatus for the catalytic treatment of hydrocarbons, comprising a reactor containing at least one tray, and containing catalyst supporting means for at least one catalyst bed, said supporting means being permeable to liquid and gas and impermeable to catalyst particles, said supporting means being attached to the inner wall of the reactor and being at least partly in the shape of a conical surface of a truncated cone converging downwardly to an aperture permeable to catalyst particles, one of said trays being located beneath each supporting means, said trays being permeable to liquid and gas for effecting redistribution of liquid flowing out



of the catalyst bed and impermeable to catalyst particles and having an aperture which is permeable to catalyst particles.

3,966,421

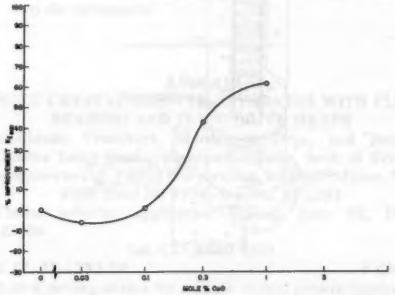
ULTRA-HIGH STRENGTH STEEL CONTAINING CaO, MgO, BaO OR SrO HAVING IMPROVED RESISTANCE TO ENVIRONMENTAL STRESS CORROSION CRACKING

Herbert E. Townsend, Jr., Allentown; James B. Horton, Bethlehem, and Louis R. Woodyatt, Whitehall, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed June 18, 1973, Ser. No. 371,195

Int. Cl.² C22C *1/05*

U.S. Cl. 29—182.5 **15 Claims**



1. A composition of matter consisting essentially of a dispersion of particles of a metal oxide selected from the group consisting of CaO, BaO, MgO, and SrO and mixtures thereof in a ferrous metal matrix, said metal oxide present in an amount from about 0.1 to less than 3 mole percent, said composition characterized by an improved resistance to environmental stress corrosion cracking when heat treated to a yield strength in excess of 160,000 pounds per square inch.

3,966,422

POWDER METALLURGICALLY PRODUCED ALLOY SHEET

Eugene W. Kelley, Kokomo, Ind., assignor to Cabot Corporation, Kokomo, Ind.

Filed May 17, 1974, Ser. No. 470,746
Int. Cl.² B22F *3/00, 8/00, 1/00*
U.S. Cl. 29—182.7 10 Claims

1. A new article of manufacture comprising an alloy sheet suitable for cutting edges produced by hot working to gauge a slab of hot consolidated atomized prealloyed powder, the powder consisting of about 27% to about 32% chromium, about 3.5% to about 5.5% tungsten, about 0.19% to about 2.4% carbon, up to about 1.5% molybdenum, up to about 2% manganese, up to about 3% iron, up to about 2% silicon, up to about 3% nickel, up to about 1% boron, and the balance cobalt, the consolidation and hot working being carried out at temperatures less than about 2300°F, the microstructure of the sheet comprising a dispersion of carbide particles in a solid solution matrix, the carbide particles having an average size less than 10 microns.

3,966,423

GRAIN REFINEMENT OF TITANIUM CARBIDE TOOL STEEL

M. Kumar Mal, 99 N. Pascack Road, Spring Valley, N.Y. 10977, and Stuart E. Tarkan, 152 Grandview Ave., Monsey, N.Y. 10952

Filed Nov. 6, 1973, Ser. No. 413,339
Int. Cl.² B22F *3/00*
U.S. Cl. 29—182.7 16 Claims

1. A steel-bonded titanium carbide composition formed of primary grains of titanium carbide of average size less than 5 microns dispersed through a steel matrix characterized by an austenitic decomposition product, said composition containing an effective amount of a grain-growth inhibitor corresponding to by weight of about 0.25% to 2% of a Group VB carbide, said composition in the hardened state being characterized by improved anti-friction properties and improved resistance to wear.

12. A method of inhibiting the grain growth of titanium carbide grains in the production of a sintered, steel-bonded titanium carbide composition containing primary grains of titanium carbide dispersed through a steel matrix making up essentially the balance which comprises, providing a powder mixture of titanium carbide with powdered steel-forming ingredients, including an effective amount of a grain growth inhibitor corresponding to about 0.25% to 2% by weight of a Group VB carbide, compacting said mixture to a desired shape and sintering said shape at an elevated liquid phase sintering temperature of said matrix, whereby the titanium carbide grains in the resulting sintered product are characterized by an average grain size of less than 5 microns, by improved anti-friction properties and by improved resistance to wear by virtue of the presence of said effective amount of said Group VB carbide.

3,966,424

WELDING MATERIAL FOR SUPER LOW TEMPERATURE STEELS

Tomokazu Godai; Toboru Sugiyama, and Katushi Nishimura, all of Kamakura, Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Continuation-in-part of Ser. No. 242,202, April 7, 1972, Pat. No. 3,853,611. This application Oct. 7, 1974, Ser. No. 512,915
Claims priority, application Japan, Apr. 10, 1971, 46-22530
The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.
Int. Cl.² B32B *15/16*
U.S. Cl. 29—191.2 2 Claims

1. A welding material which is suitable for low temperature steels, which comprises:

a combination of metal-forming material and a lime-titania flux, wherein said metal-forming material and flux are combined in such a fashion that the integrity of the flux and the metal-forming material as distinct entities is maintained in said combination, said metal-forming material consisting of no more than 0.2% carbon, 5 – 12% manganese, no more than 30% chromium, 4 – 8% niobium, no more than 22% iron, no more than 1.5% silicon, and the balance being essentially nickel, and said flux consisting essentially of a mixture of 10 – 50% calcium carbonate, 16 – 50% fluorspar, 2 – 20% magnesia clinker and no more than 10% rutile and alloy-constituting elements of no more than 1.6% carbon, no more than 55% manganese, no more than 60% chromium, no more than 24% niobium, and no more than 10% silicon with the proviso that the total amount of the alloy constituting elements in said flux does not exceed 60%, wherein all the elements contained in the metal-forming material and flux are adjusted such that the composition, calculated on the basis of the metal-forming material, consists essentially of no more than 0.2% carbon, 5 – 12% manganese, no more than 30% chromium, 4 – 8% niobium, no more than 22% iron and no more than 1.5% silicon, the balance being essentially nickel.

3,966,425

STAINLESS STEEL WIRE HAVING NICKEL PLATED LAYER

Keinosuke Takeo, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 20,186, March 17, 1970, abandoned.
This application Feb. 27, 1975, Ser. No. 553,720
Claims priority, application Japan, Mar. 18, 1969, 44-21144
Int. Cl.² B32B *15/00*
U.S. Cl. 29—191.6 1 Claim

1. A cold drawn wire, useful in forming coiled springs without frictional seizure or galling, comprising a stainless steel wire having a plated coating consisting essentially of nickel thereon of a thickness of from 0.1 to 15 microns.

3,966,426

COOKING VESSEL FOR USE WITH INDUCTION HEATING COOKING UNIT

Robert A. McCoy, Turtle Creek, and William C. Moreland, II, Export, both of Pa., assignors to White-Westinghouse Corporation, Cleveland, Ohio

Filed Mar. 24, 1972, Ser. No. 237,703
Int. Cl.² H05B *1/02*
U.S. Cl. 29—196.2 5 Claims

1. A cooking vessel for use with an induction heating cooking device operating at a frequency between 20 and 40 kilohertz and having a laminated wall adapted to be placed in proximity with the induction coil of said device, said laminated wall including at least three metallic layers comprising:

one layer of a magnetic material having a thickness of at least one skin depth within the range of operating frequencies of said device when the vessel is in use, to develop the major part of the power in said one layer and to prevent substantial penetration of the magnetic field produced by said coil beyond said layer;

another layer, farther from said coil than said one layer in use, of relatively high thermal conductivity material, in excess of about 50 BTU/hr/sq. ft/°F./ft., to promote the uniform distribution of heat derived from said one layer throughout said another layer; and

an additional layer on the face of said one layer opposite said another layer, said additional layer being of a metallic material having relatively low magnetic permeability with the field intensity produced by said coil, a thickness of between one-fifth and one-twentieth of one skin depth within the range of said operating frequencies, and a

relatively high electrical resistivity as compared to the electrical resistivity of said one layer.

3,966,427

PRODUCTION OF BRIQUETTES

Robert Herment, Grand-Couronne; Yves Lafage, Paris; Jean Claude Emo, and Jean Marie Yurcek, both of Grand-Couronne, all of France, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 17, 1975, Ser. No. 542,134

Claims priority, application France, Jan. 18, 1974, 74.01758

Int. Cl.² C10L 5/00, 5/16; C22B 1/08

U.S. Cl. 44—10 H 8 Claims

1. A process for producing briquettes comprising admixing water-containing solid particles selected from the class consisting of mineral ore, coal and carbonaceous soot or a mud of said particles in a mixer with a bituminous binder selected from the group consisting of powdered bitumen, molten bitumen and bitumen emulsion, and then subsequently compressing the resultant mixture directly after mixing, without separation of a substantial amount of liquid water from the mixer, into briquettes at a temperature which is at least equal to about the softening point temperature, as measured by the Ring and Ball method, minus 40°C of the bitumen present in the bituminous binder, the amount of the binder being such that the briquettes contain from about 1 to about 12% by weight of said binder.

3,966,428

ETHYLENE BACKBONE POLYMERS IN COMBINATION WITH ESTER POLYMERS HAVING LONG ALKYL SIDE CHAINS ARE LOW VISCOSITY DISTILLATE FUEL COLD FLOW IMPROVERS

Albert Rossi, Warren, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Oct. 31, 1973, Ser. No. 411,289

Int. Cl.² C10L 1/18

U.S. Cl. 44—62 9 Claims

1. A light middle distillate fuel oil having a viscosity in the range of about 1.6 to 7.5 centistokes at 100°F boiling in the range of 250° to 750°F, which has been improved in its low temperature flow properties by about 0.002 to 0.5 wt. % based on the weight of the total composition, of a synergistic flow improving mixture of 0.5 to 10 parts by weight of an oil soluble ethylene backbone middle distillate pour point depressing polymer having a molecular weight in the range of about 500 to 50,000 per part by weight of an oil soluble long side chain ester-containing polymer operable as a residua flow improver and having a molecular weight in the range of about 1000 to 100,000,

wherein said ethylene backbone pour point depressant is selected from the group of polymers consisting of:

1. chlorinated polyethylene containing about 10 to 30 wt. % chlorine,
2. copolymers consisting essentially of 3 to 40 molar proportions of ethylene with a molar proportion of C_3 to C_{16} alpha monoolefin, and
3. copolymers consisting essentially of 3 to 40 molar proportions of ethylene with a molar proportion of an ethylenically unsaturated alkyl ester of the formula:

wherein R_1 is hydrogen or methyl, R_2 is a —$OOCR_4$ or —$COOR_4$ group wherein R_4 is hydrogen or a C_1 to C_{16} alkyl group, and R_3 is hydrogen or —$COOR_4$;

wherein said long side chain ester containing polymer is characterized by at least 25 wt. % of the polymer being straight chain C_{18}-C_{44} alkyl groups extending from ester linkages, said long chain ester polymer being selected from the group consisting of:

A. polyester condensation product of 0.8 to 1.6 molar proportions of an alkenyl or alkyl succinic anhydride or its corresponding acid containing a linear hydrocarbon group of 16 to 44 carbon atoms with 0.8 to 1.2 molar proportions of a polyol containing 2 to 6 hydroxy groups and a total of 2 to 12 carbon atoms, and 0.7 to 2.2 molar proportions of a C_{20} to C_{44} saturated aliphatic monocarboxylic acid;

B. addition polymers comprising moieties of long side chain unsaturated esters represented by the formula:

wherein R_1 is hydrogen or a C_1 to C_3 alkyl group, R_2 is a —$OOCR_4$ or —$COOR_4$ group wherein R_4 is a C_{20} to C_{44} straight chain alkyl group, and R_3 is hydrogen or —$COOR_4$; and

C. polymers of about equi-molar proportion of C_{18} to C_{40} mono alpha aliphatic olefin with an unsaturated C_4 to C_{10} dicarboxylic acid or anhydride and esterified with about 0.5 to 1.0 molar proportion of C_{20} to C_{40} linear, saturated, alcohol;

said synergistic flow improving mixtures being polymer combinations of: (1) and (B); (2) and (A); (3) and (A); and (3) and (C).

3,966,429

MANGANESE CONTAINING FUELS

James W. Sprague, Bedford; Daniel W. Feldman, Beachwood, and Frank Veatch, Cleveland, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed May 16, 1974, Ser. No. 470,692

Int. Cl.² C10L 1/18

U.S. Cl. 44—68 12 Claims

1. In a gasoline composition for combustion in a gasoline internal combustion engine comprising gasoline and a gasoline soluble manganese tricarbonyl compound as an additive, the improvement comprising

including a small but effective amount of a trialkyl citrate compound, said compound being soluble in gasoline and acting as a gasoline additive to improve the performance of the gasoline internal combustion engine.

3,966,430

CARBURETOR ADAPTER

Woodrow W. Stephens, 2704 S. Mulberry St., Muncie, Ind. 47302

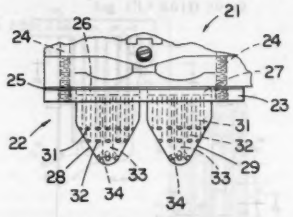
Filed July 10, 1975, Ser. No. 595,325

Int. Cl.² F02M 29/04

U.S. Cl. 48—180 R 3 Claims

1. An apparatus adapted for insertion between the carburetor and the intake manifold of an internal combustion engine, said apparatus comprising a generally flat base and at least one solid conical member depending from one face of the base, the other face of the base being undercut in register with the

depending conical member, a series of spaced apertures extending through said conical member parallel to the axis of the member, a central aperture of larger diameter than said first mentioned spaced apertures coincident with the axis of the conical member and extending adjacent to but not through the



apex of said conical member, and a further series of spaced apertures extending to the exterior of the cone shaped member from said central aperture, said further series of spaced apertures being adjacent the apex of said cone shaped member and extending at an acute angle with the axis of the cone shaped member.

3,966,431

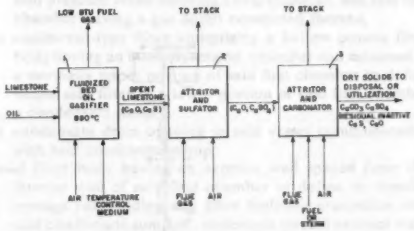
WASTE STONE OXIDATION AND RECARBONIZATION

John W. T. Craig, E. Hendred near Wantage, England; Eoin P. O'Neill, and Dale L. Keairns, both of Pittsburgh, Pa., assignors to The United States of America as represented by the United States Environmental Protection Agency, Washington, D.C.

Filed Feb. 21, 1975, Ser. No. 551,786

Int. Cl.² C10J *1/00*; C10K *1/34*

U.S. Cl. 48—197 R **5 Claims**



1. A process for the desulfurization and gasification of a sulfur-containing fuel comprising:

contacting said sulfur-containing fuel with a particulate calcium oxide-containing material, in a first reaction zone, at a temperature sufficient to gasify said fuel and to cause the sulfur contained therein to react with the calcium oxide to form calcium sulfide coatings on the particles and to produce a fuel gas overhead of reduced sulfur content;

transferring said calcium sulfide-coated particles from said first reaction zone to a second reaction zone, wherein said particles are contacted with a free oxygen-containing gas at a temperature sufficient to convert at least a portion of said calcium sulfide to calcium sulfate, thereby forming sulfated particles;

transferring said sulfated particles to a third reaction zone wherein said sulfated particles are contacted with a carbon dioxide-containing gas to convert at least a portion of the calcium oxide contained in said sulfated particles into calcium carbonate, thus forming an environmentally stable particulate material comprising calcium sulfate and calcium carbonate.

3,966,432

LIQUID ABRASIVE COMPOSITIONS CONTAINING A SILICATE SUSPENDING AGENT

George Geoffrey Rayner, Eccles, England, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed June 14, 1974, Ser. No. 479,328

Claims priority, application United Kingdom, July 6, 1973, 32367/73

Int. Cl.² C04B *31/16*; C09C *1/68*

U.S. Cl. 51—308 **12 Claims**

1. A liquid abrasive composition comprising an aqueous suspension of about 25–60% of a substantially waterinsoluble particulate abrasive, about 3–8% of a nonionic surfactant and about 0.25–1.0% of suspending agent selected from natural and synthetic clays, hydrophobically treated clays, fumed silica, magnesium montmorillonite, and complex magnesium aluminum silicates.

3,966,433

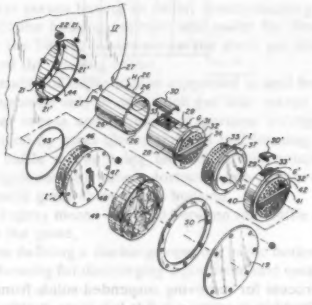
PURIFIER

Victor D. Molitor, 2829 S. Santa Fe Drive, Englewood, Colo. 80110

Filed Apr. 24, 1974, Ser. No. 463,458

Int. Cl.² B01D *53/04*

U.S. Cl. 55—66 **7 Claims**



1. A purifier comprising:

a first series of passages in heat exchange relationship with a second series of passages provided by opposed, interspaced cylindrical shells connected to end plates and having a circular periphery of decreasing diameter inwardly, said shells being of decreasing diameter and length from the outside inwardly;

a container for gettering material disposed centrally of said shells;

a heater for heating said gettering material to a predetermined temperature and for heating the gases passing through said container;

said end plates including alternate end plates at one end of said shells having holes for transferring incoming gases from one incoming passage to the next incoming passage;

alternate end plates at the opposite end being annular with an inside diameter permitting passage of outgoing gases from one outlet passage to the next outer outlet passage; and

additional shells extending from each end plate toward the opposite end plate but being spaced from the opposite end plate to permit gases to pass around the spaced edges of said additional shells.

6. A method of purifying a predetermined gas to remove at least two gaseous impurities, wherein one or more of said impurities are removed by a first gettering material operating at a predetermined temperature and one or more of such gaseous impurities are removed by a gettering material operating at a lower temprature; which comprises:

passing incoming gas to be purified through a labyrinth passageway in heat exchange relation to the outgoing gases and through a bed of said first gettering material heated to said predetermined temperature;

during said passage of the outgoing gases in heat exchange relation with the incoming gases, passing the same through said second bed at said lower temperature; and

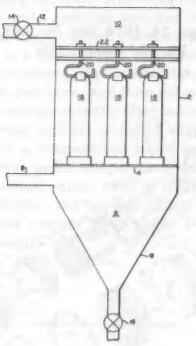
passing said outgoing gases from said second bed in heat exchange relationship with said incoming gases at temperatures below said lower temperature.

3,966,434

METHOD FOR FILTERING GAS AND CLEANING OF FILTER BAGS

Arthur E. Frazier, Elmore, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 21, 1974, Ser. No. 516,480
Int. Cl.² B01D *46/04*
U.S. Cl. 55—96 **2 Claims**



1. A process for removing suspended solids from a stream of gas comprising passing a solids-laden gas stream through a filter bag in a bag filter compartment, wherein said bag is fabricated from a polytetrafluoroethylene woven fabric wherein said bag is heat-stabilized, and wherein said filter bag is mounted in said filter compartment with 0.5 to 5 percent longitudinal slack, based upon the bag length when there is no differential pressure across said bag and wherein during filtration the differential pressure across said bag removes said slack by causing said bag to expand, collecting clean gas in a closed compartment enclosing said filter bag, exhausting said clean gas via an open exhaust valve, closing said exhaust valve whereby when said exhaust valve is closed, the differential pressure across said bag approaches zero, said bag becomes slack and the solids deposited on the filter surface disengage therefrom and fall to collection chamber, after which, said exhaust valve is opened and the step of removing solids from said stream of gas is resumed.

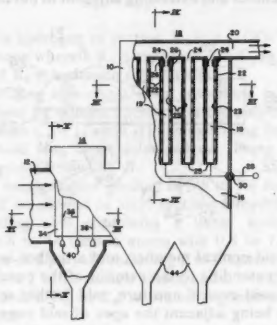
3,966,435

ELECTROSTATIC DUST FILTER

Gaylord W. Penney, 216 Paris Road, Pittsburgh, Pa. 15235

Filed May 2, 1974, Ser. No. 466,131
Int. Cl.² B03C *3/00*
U.S. Cl. 55—131 **15 Claims**

1. An electrostatic filter for collecting a mixture of electrically-charged solid particles of opposite polarities, said filter comprising spaced filter members having fabric filter elements with generally parallel surfaces, and said filter elements also have surface irregularities, means for maintaining a unidirectional electric field between said filter members in a direction generally perpendicular to said surfaces, whereby said filter members are of opposite relative polarities, and means for directing said mixture of particles into the space between the filter members in a direction generally parallel to said surfaces



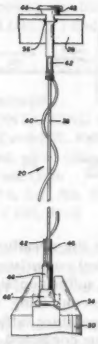
of the filter elements and transverse to said electric field to cause the particles to move in opposite directions in accordance with their polarities and to deposit on said surfaces in porous layers.

3,966,436

DISCHARGE ELECTRODE

William E. Archer, Huntington Beach, Calif., assignor to Wahlco, Inc., Costa Mesa, Calif.

Filed July 8, 1974, Ser. No. 486,548
Int. Cl.² B03C *3/41*
U.S. Cl. 55—147 **4 Claims**



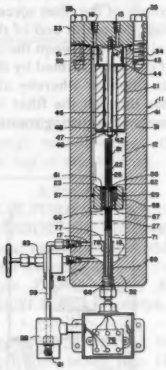
1. An electrode assembly adapted to be supported within an electrostatic precipitator comprising: an elongated, substantially straight, electrically conductive electrode member; a generally helical electrically conductive electrode member having end portions; a major portion of said straight member being radially spaced from and encompassed by said helical member; securing means electrically connecting and mechanically securing said end portions of said helical member to said straight member; and weight means connected to said straight member for holding said straight member in tension; wherein only the major extent of said helical member between said end portions is free to move into and out of engagement with said straight member during normal operation in an electrostatic precipitator.

3,966,437

HIGH PRESSURE GAS-LIQUID SEPARATOR

Charles F. DeWolf, Alameda, and William S. Gault, Castro Valley, both of Calif., assignors to Rix Industries, Emeryville, Calif.

Filed July 31, 1973, Ser. No. 384,245
Int. Cl.² B01D 29/42
U.S. Cl. 55—219 2 Claims



1. A high pressure gas-liquid separator adapted for connection in high pressure gas lines for removing condensate therein comprising:

a pressure vessel having a wall means formed for containment of a gas pressure up to about 15,000 psi, therein, said pressure vessel defining a first chamber, and said first chamber having a gas outlet connected thereto;

a coalescent-type filter comprising a hollow porous filter body having an interior, second, chamber and mounted in a normally upper portion of said first chamber to define below said filter in a lower portion of said first chamber a condensate sump;

a condensate drain opening in said vessel communicating with said condensate sump;

said filter body having an exterior wall spaced from the interior wall of said first chamber to define an annular passage surrounding said filter body for gravitation into said condensate sump of condensate on said exterior wall;

a gas inlet passage communicating with said second chamber for gas flow into said second chamber and for gas flow through said porous filter body to said exterior wall, said filter body being adapted to coalesce condensate from gas passing through said filter body and release coalesced condensate on said exterior wall;

an elongate guide tube mounted in said first chamber below said filter in a generally upright position of use and being sealed in a normally lower end of said vessel, said guide tube being adapted to withstand high gas pressures in said first chamber;

a float composed of snytactic material mounted in said first chamber and on said guide tube for vertical reciprocation;

a pair of magnetically operated switches mounted interiorly of said guide tube in longitudinally spaced positions representing high and low condensate levels;

an electrically operated valve connected to said drain opening;

magnetic means carried by said float and operating said switches at relatively high and low condensate levels respectively; and

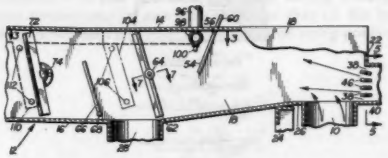
an electric control circuit connected to said switches and electrically operated valve.

3,966,438

APPARATUS FOR WASHING STACK GASES

Jerry W. Nicholson, 668 SW. McVey, Apt. 59, Lake Oswego, Oreg. 97034

Filed Dec. 5, 1974, Ser. No. 529,819
Int. Cl.² B01D 47/10
U.S. Cl. 55—238 5 Claims



1. Apparatus for washing stack gases and the like, comprising:

a. a hollow housing defined by top, bottom and side walls and having an outlet at one end,

b. means arranged to support said housing in substantially a horizontal position across the top of a stack,

c. stack gas inlet means in the bottom wall of said housing adjacent the end opposite said outlet arranged to communicate with the top opening of a stack and to receive stack gases therefrom.

d. blower means having an outlet communicating with the end of the housing opposite said outlet for directing air from the blower means across the stack gas inlet means toward the housing outlet,

e. a plurality of baffle means supported in said housing on the opposite side of said stack gas inlet means from the blower means and having face portions arranged to be impinged by gases forced through said housing,

f. said baffle means being located in said housing in an arrangement providing a tortuous path of movement of the stack gases through the housing,

g. liquid spray means disposed between said baffle means to wash the gases,

h. means defining a discharge opening in the bottom wall of said housing for discharging liquid from said spray means, and

i. adjustable mounting means for some of said baffle means in said housing, said adjustable mounting means providing adjustment of certain of said some of said baffle means on an axis at right angles to the longitudinal length of the housing and providing adjustment of others of said some of said baffle means on a universal axis whereby to establish a selected path of tortuous movement of stack gases through said housing.

3,966,439

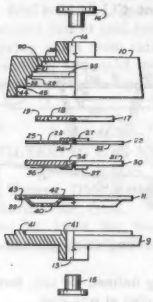
FLUID SAMPLING DEVICE

Spyros-Lysander N. Vennos, 4003 Milldale Court, Phoenix, Md. 21131

Filed Nov. 11, 1974, Ser. No. 522,904
Int. Cl.² B01D 53/30
U.S. Cl. 55—270 9 Claims

1. A sample collection unit comprising in combination a hollow two piece cassette having a removable bottom member having an inlet port therein, a top member frictionally and imperviously engaging said bottom member and containing a valving structure means permitting unidirectional flow from said inlet port to said outlet port said top member having an outlet port therein, a filter capsule removably positioned in said cassette between said top and bottom members said filter capsule comprising at least two parts, one of said parts facing said inlet port of said cassette and consisting of a nonhygroscopic impervious shield having an aperture therein in registry with the inlet port of said removable bottom member, another of said parts comprising a filter mounted adjacent to and touching said shield in a region of the shield surrounding said

aperture, the mounting of said filter with said shield causing a portion of its surface area to separate from said shield during flow conditions and to return to its original position when flow



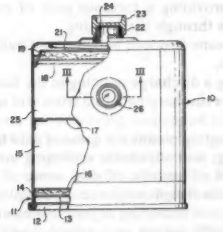
ceases, and means engaging the peripheral edge of said capsule to hold said capsule between the top and bottom members of said cassette.

3,966,440

COLORIMETRIC VINYL CHLORIDE INDICATOR

Charles Clifton Roberts, Pittsburgh, Pa., assignor to Catalyst Research Corporation, Baltimore, Md.

Filed June 3, 1975, Ser. No. 583,421
Int. Cl.² B01D *46/30*
U.S. Cl. 55—274 **3 Claims**



1. In a canister for removing airborne vinyl organo material from the atmosphere having an inlet and an outlet port and an inner chamber substantially filled with an active particulate material positioned between said inlet and outlet port for removing said airborne vinyl organo material and including an indicator window positioned for viewing into said inner chamber and adjacent to said outlet port, the improvement comprising a solid vinyl organo colorimetric indicating material positioned immediately behind said indicator window and extending into said active material, said vinyl organo colorimetric indicating material consisting of activated alumina impregnated with between 0.5 and 5.0% by weight potassium permanganate.

3,966,441

LINT DISPOSAL APPARATUS

Benjamin H. Freze, Garden Grove, Calif., assignor to Challenge-Cook Bros., Incorporated, City of Industry, Calif

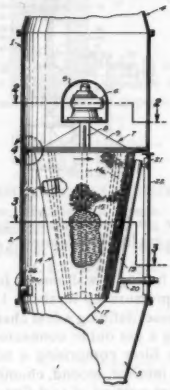
Continuation-in-part of Ser. No. 257,018, May 25, 1972, abandoned. This application Sept. 30, 1974, Ser. No. 510,369
Int. Cl.² B01D *46/26*
U.S. Cl. 55—290 **10 Claims**

1. An apparatus for the disposition of combustible particulate matter, contained in an air stream moving in a duct, said apparatus, comprising:

a. a shell having a relatively coaxial inlet end and outlet end interposed in the duct with its inlet end and outlet end joined thereto;

b. an annular filter screen structure closed at one end and extending longitudinally within the shell between its inlet end and outlet end, the screen structure defining with the shell an inlet chamber exteriorly of the filter screen structure, including its closed end, said inlet chamber communicating with the inlet end of the shell, and an outlet chamber interiorly of the filter screen structure and communicating with the outlet end of the shell;

c. an annular seal means between the outlet end of the shell and the outlet chamber formed by the screen structure to close the inlet chamber whereby all flow of air through the duct passes through the filter screen structure, said annular seal means permitting rotation of the filter screen structure;



d. means attached to an end of the screen structure for rotating the filter screen structure at sufficient surface speed to cause the air stream and entrained particulate matter, on approaching the filterscreen structure, to rotate therewith, the air stream flow and the surface speed of the filter screen structure being sufficient to exert a force continuously urging the particulate matter off the filter screen structure in opposition to air flow through the filter screen structure and cause the particulate matter to remain partially suspended in proximity to the surface of the filter screen structure;

e. and a longitudinally extending heating means directed toward a narrow zone of the external surface of the filter screen structure and maintained at a temperature above the combustion temperature of the particulate matter thereby to burn off the particulate matter as the filter screen structure rotates past the heating means.

3,966,442

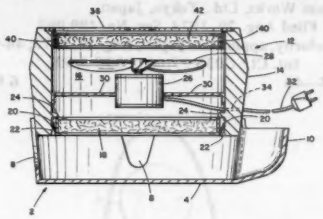
ODOR MASKING AND FILTERING ASHTRAY

Bruce M. Waters, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.

Filed Sept. 30, 1974, Ser. No. 510,644
Int. Cl.² B01D *50/00*
U.S. Cl. 55—316 **9 Claims**

1. A filtering ashtray apparatus comprising: an ashtray base having a vertically extending side wall provided with openings therein sufficiently large to accommodate items being smoked and to permit their movement therein; an annular housing on the top of said ashtray base extending therein to rest on the

side wall thereof enclosing said ashtray base except for said openings; said openings extending below the bottom of said housing; filter means mounted in said housing; and a motor



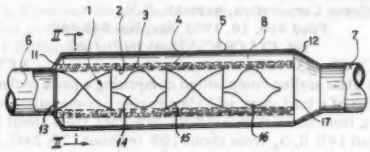
driven fan mounted in said housing for drawing air and smoke in said ashtray through said openings, through said filter means and out of the top of said housing.

3,966,443

EXHAUST GAS PURIFIER FOR INTERNAL COMBUSTION ENGINE

Ryoichi Okano, Nagoya; Tsuchio Bunda; Shinichiro Mizusawa, both of Okazaki, and Akiyoshi Morita, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Kabushiki Kaisha Tsuchiya, Nagoya, both of, Japan

Filed Apr. 15, 1974, Ser. No. 460,895
Claims priority, application Japan, Apr. 18, 1973, 48-043981
Int. Cl.² B01D *50/00*
U.S. Cl. 55—337 **6 Claims**



1. An exhaust gas purifier comprising, a casing, at least one porous tube surrounded by porous filter means within the casing, said porous tube having an interior and an exterior, said tube and casing having a gas flow space between said casing and the exterior of said tube; gas inlet means at one end of the casing for directing gas into the interior of said porous tube, and gas outlet means at the other end of the casing for receiving gas from said gas flow space; baffle means in said tube for mixing gas from said inlet and for diverting gas through said porous tube and into the gas flow space, said baffle means comprising, a series of flat plates each twisted at least **180°** between end edges thereof and aligned with the porous tube, end edges of adjacent plates being at right angles to each other so that the mixing action of the plates is enhanced.

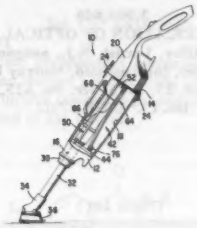
3,966,444

VACUUM CLEANER FILTER ASSEMBLY

Earl R. Clowers, and Walter G. Azelkas, both of Anderson, S.C., assignors to The Singer Company, New York, N.Y.

Filed Apr. 4, 1975, Ser. No. 565,039
Int. Cl.² B01D *46/02*
U.S. Cl. 55—356 **2 Claims**

1. In a lightweight vacuum cleaner having a hollow lower housing including an aperture at one end and open at the other end, a filter bag compartment defined within said lower housing, an inlet air conduit having a nozzle at one end, means for securing the conduit to the lower housing with its other end positioned within the aperture, and an upper housing having suction creating means removably secured to the open end of the lower housing with said suction creating means communicating with said filter bag compartment, an improved filter assembly comprising: a support plate including an integral open ended guide tube positioned in said compartment, said guide tube extending from a face of the plate toward the open end of the lower housing and in flow communication registration with said aperture, said plate having a marginal border conforming in size and shape to that of the lower housing at the aperture end, said guide tube being positioned



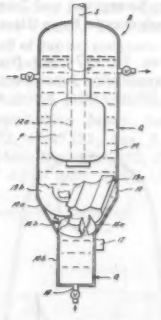
about said other end of the intake air conduit, a frame having elongated legs secured to said plate and extending toward the open end of the lower housing, said frame including a grasping member at the upper extremity of said legs, a porous filter bag having at least two interior compartments, one compartment including a tubular inlet portion receivable about said guide tube, a second compartment having an opening communicating with the first compartment remote from the tubular portion and having a dirt storage cavity remote from the opening, and means for removable securing said tubular inlet portion about said guide tube, said assembly being removable as a unit from the open end of the lower housing.

3,966,445

FREEZE REFINING METHOD

Clyde C. Adams, P.O. Box 31, French Settlement, La. 70733

Filed June 7, 1974, Ser. No. 477,366
Int. Cl.² B01D *9/00, 9/04*
U.S. Cl. 62—58 **7 Claims**



1. A method of crystal collection, including the steps of:
providing a vessel containing a liquid melt, said melt including pure and impure materials;
said pure materials being capable of collection in crystalline form;
maintaining said melt in substantially a liquid phase in said vessel;

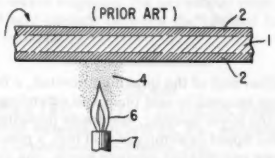
providing a rotatable cooling shaft in said melt;
collecting heterogeneous material in discrete crystalline form on said shaft by substantially radial grain growth with respect to said shaft with said discrete cystals including substantially pure material within and having grain boundaries at least partly formed of said impure materials; and wherein the improvement comprises,
using centrifugal force caused by rotation of said cooling shaft to remove said heterogeneous material from said shaft in solid chunk form without fully melting by separating said material along the grain boundaries thereof.

3,966,446

AXIAL FABRICATION OF OPTICAL FIBERS

Stewart Edward Miller, Locust, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 23, 1975, Ser. No. 625,318
Int. Cl.² C03B *37/02*
U.S. Cl. 65—2 **6 Claims**



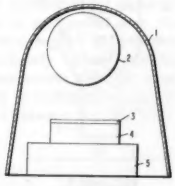
1. A method of forming an optical fiber, comprising:
forming thermochemically a particulate glass precursor material capable of being consolidated into a glass of optical loss less than 50 db/km;
rotating a base member about an axis substantially perpendicular to its flat surface;
directing axially a stream of the said particulate matter onto the rotating flat base member from a direction substantially perpendicular to the surface of the base member; and
drawing the structure into an optical fiber.

3,966,447

HEAT ABSORBING SEALING METHOD FOR LASER GLASS

Yoshiyuki Asahara, Kanagawa, and Tetsuro Izumitani, Hino, both of Japan, assignors to Hoya Glass Works, Ltd., Tokyo, Japan

Filed Aug. 20, 1974, Ser. No. 499,097
Claims priority, application Japan, Aug. 20, 1973, 48-93078
Int. Cl.² C03B *23/20, 27/00*; C03C *3/00*
U.S. Cl. 65—40 **8 Claims**



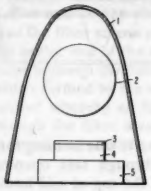
1. A sealing method for a laser glass which comprises applying a powder mixture of (1) a low melting glass containing an infrared absorbing component and (2) a low expansion high melting glass containing an infrared absorbing component to an Nd laser glass and then welding the powder mixture to the laser glass by heating.

3,966,448

SEALING METHOD FOR LASER GLASS

Yoshiyuki Asahara, Kanagawa; Tetsuro Izumitani, Hino, and Kenji Nakagawa, Tikorozawa, all of Japan, assignors to Hoya Glass Works, Ltd., Tokyo, Japan

Filed Aug. 20, 1974, Ser. No. 499,098
Claims priority, application Japan, Aug. 20, 1973, 48-93077
Int. Cl.² C03B *27/00*; C03C *3/00*
U.S. Cl. 65—43 **6 Claims**



1. A sealing method for a laser glass which comprises applying a powder mixture consisting essentially of (1) a low melting glass for sealing a glass laser and (2) a glass having a melting point higher than the melting point of the low melting glass and an expansion coefficient lower than the expansion coefficient of the low melting glass to an Nd laser glass and welding the glass mixture to the laser glass by heating.

3,966,449

SEALING GLASS COMPOSITION AND PROCESS

Betty Jane Foster, and Rao Ramamohana Tummala, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 10, 1975, Ser. No. 548,649
Int. Cl.² C03C *27/00, 3/12, 3/00*
U.S. Cl. 65—43 **3 Claims**

1. A glass sealing composition comprising a paste including; particles of a lead glass, said glass having a composition of, by weight, from about 66% to about 76% PbO, from about 8.6% to about 14% B_2O_3, from about 10% to about 12% ZnO, from about 2% to about 4% SiO_2, from about 0.7% to about 2% BaO, from 0 to about 5.0% CuO, from 0 to about 1.7% Al_2O_3, and from 0 to about 0.2% Na_2O; from about 1 to about 3% by weight of said glass of finely divided TiO_2; and from about 5 to about 20% by weight based on the total weight of paste of terpineol.

3,966,450

ANIMAL WASTE ODOR TREATMENT

Eugene T. O'Neill, Hightstown, and William H. Kibbel, Jr., Pennington, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Aug. 12, 1974, Ser. No. 496,518
Int. Cl.² C05F *3/00*; C02C *1/40*
U.S. Cl. 71—15 **5 Claims**

1. A process for simultaneously controlling the odor of an animal waste slurry and increasing the plant nutrient values in said animal waste slurry, which comprises:
contacting an animal waste slurry with about 5 ppm to about 500 ppm hydrogen peroxide as an aqueous hydrogen peroxide solution based on 100% hydrogen peroxide;
adjusting the pH of the slurry to between about 4.0 and about 8.0 with a mineral acid selected from the group consisting of phosphoric acid, sulfuric acid, and nitric acid;
mixing the slurry until the animal waste odor is no longer objectionable whereby ammonia and related amine odors are converted into ammonium salts; and
recovering a treated animal waste slurry containing increased amounts of ammonium salts selected from the

group consisting of ammonium phosphate salts, ammonium sulfate salts, and ammonium nitrate.

3,966,451

HERBICIDAL MIXTURES OF 3-LOWER ALKYL-2,1-3-BENZOTHIADIAZINONE-(4)-2,2-DIOXIDES OR SALTS THEREOF AND 1,1'-DI-(3,5-DIMETHYLMORPHOLINE-CARBONYLMETHYL)-4,4'-DIPYRIDYLIUM SALT

Adolf Fischer, deceased, late of Mutterstadt, Germany (by Caecilia Emma Fischer, legal representative), assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 432,687, Jan. 11, 1974, abandoned, which is a division of Ser. No. 343,629, March 22, 1973, Pat. No. 3,888,655. This application Feb. 10, 1975, Ser. No. 548,386

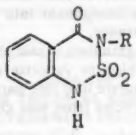
Claims priority, application Germany, Apr. 13, 1972, 2217722

Int. Cl.² A01N 9/12

U.S. Cl. 71—91 10 Claims

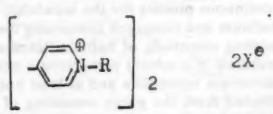
1. A herbicide composition comprising an inert carrier having dispersed therein a herbicidally effective amount of a mixture consisting essentially of

a. a compound of the formula

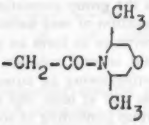


where R denotes lower alkyl of a maximum of 4 carbon atoms, or an alkali metal, alkaline earth metal, ammonium, lower hydroxyalkylammonium, lower alkylammonium or hydrazine salt thereof, and

b. a compound of the formula



where R denotes the radical



and X denotes an anion in a weight ratio of a:b of 3:1 to 1:3.

3,966,452

HERBICIDE MIXTURES OF 3-LOWER ALKYL-2,1,3-BENZOTHIADIAZINONE-(4)-2,2-DIOXIDES OR SALTS THEREOF AND LOWER ALKYL N-(4-AMINOBENZENESULFONYL)-CARBAMATES

Adolf Fischer, deceased, lat of Mutterstadt, Germany (by Caecilia Emma Fischer, legal representative), assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation-in-part of Ser. No. 432,685, Jan. 11, 1974, abandoned, which is a division of Ser. No. 343,629, March 22, 1973, Pat. No. 3,888,655. This application Mar. 17, 1975, Ser. No. 559,322

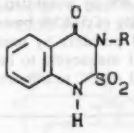
Claims priority, application Germany, Apr. 13, 1972, 2217722

Int. Cl.² A01N 9/12

U.S. Cl. 71—91 3 Claims

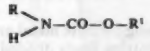
1. A herbicide composition comprising an inert carrier having dispersed therein a herbicidally effective amount of a mixture of herbicides consisting essentially of

a. a compound of the formula



where R denotes lower alkyl of a maximum of 4 carbon atoms, or an alkali metal, alkaline earth metal, ammonium, lower alkylammonium, lower hydroxyalkylammonium or hydrazine salt thereof, and

b. a compound of the formula



where R denotes aminobenzenesulfonyl and R^1 denotes lower alkyl in a weight ratio of a:b of 3:1 to 1:3.

3,966,453

HERBICIDAL 2-HALO-4-TRIFLUOROMETHYL-4'-CYANOPHENYL-ETHERS

Ryohei Takahashi, Kusatsu; Kanichi Fujikawa, Kyoto; Isao Yokomichi, Kusatsu; Tadaaki Toki, Kusatsu, and Shinzo Someya, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

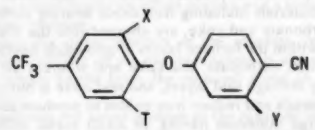
Continuation-in-part of Ser. No. 326,366, Jan. 24, 1973. This application Mar. 25, 1975, Ser. No. 561,682

Claims priority, application Japan, Jan. 27, 1972, 47-10367; May 13, 1972, 47-47322; Aug. 2, 1972, 47-76944; Dec. 6, 1972, 47-121665; Dec. 11, 1972, 47-123369

Int. Cl.² A01N 9/20; C07C 121/75

U.S. Cl. 71—105 7 Claims

1. A compound having the formula:



wherein X represents a halogen atom, T represents a hydrogen or a halogen atom, and Y represents a hydrogen atom, halogen atom, lower alkyl, lower alkoxy group.

7. The method of killing weeds which comprises applying a herbicidally effective amount of a compound of claim 1.

3,966,454

METHOD FOR PRODUCING IRON OR IRON ALLOY POWDERS HAVING A LOW OXYGEN CONTENT

Shunji Ito; Yasuaki Morioka; Yoshihiro Kajinaga; Minoru Nitta, all of Chiba, and Ichio Sakurada, Ichihara, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed June 23, 1975, Ser. No. 589,564
Claims priority, application Japan, June 24, 1974, 49-71250
Int. Cl.[2] B22F 9/00
U.S. Cl. 75—.5 BA 11 Claims

1. A method for producing iron or iron alloy powders having a low oxygen content to be used for powder metallurgy comprises subjecting iron or iron alloy powder materials having an oxygen content of not more than 8% by weight and a total carbon amount including carbon alloyed in said powders being not more than 6% by weight to an induction heating under a relative density of 5–65% based on a density of the molding steel of said powders by means of an alternating current of 50 cycles-1 megacycle to heat said powders at a temperature of 750°–1,400°C to effect reduction rapidly.

3,966,455

PROCESS FOR ILMENITE ORE REDUCTION

Paul Franklin Taylor, P.O. Box 468, Crossville, Tenn. 38555

Continuation-in-part of Ser. No. 117,098, Feb. 19, 1974, Pat. No. 3,811,871. This application Mar. 28, 1974, Ser. No. 455,624
Int. Cl.[2] C22C 38/14; C22B 5/00
U.S. Cl. 75—21 2 Claims

1. A method of reducing ilmenite metal ore oxides comprising the steps of: (a) Admixing finely divided ilmenite ore with a liquid chemical solution consisting essentially of about 24.2 parts by weight of phosphoric acid, about 0.5 parts by weight of zinc oxide, and about 1.0 part by weight of a sulfated surfactant, (b) admixing and dissolving about one-half pound finely divided limestone (calcium carbonate, $CaCO_3$) or the carbonate of a Class IA or IIA metal per approximately 20 pounds of concentrated ilmenite ore, (c) stirring to aid chemical reaction and maintain mixture homogeneity, (d) heating the mixture to vaporize volatile materials and until residue is baked to a dry and solid state, and (e) smelting the remaining solid material to produce iron - titanium alloy metal.

3,966,456

PROCESS OF USING OLIVINE IN A BLAST FURNACE

Frank H. Ellenbaum, Hinsdale, Ill., and Richard Ciesco, Griffith, Ind., assignors to Molten Metal Engineering Co., Willowbrook, Ill.

Filed Aug. 1, 1974, Ser. No. 493,696
Int. Cl.[2] C21B 5/04
U.S. Cl. 75—41 6 Claims

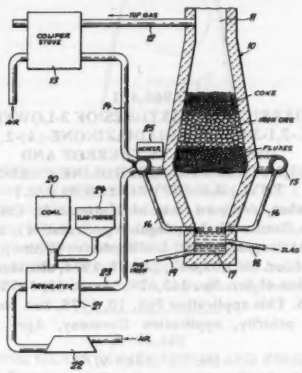
1. In a process for producing iron in a blast furnace wherein charge materials including iron oxide bearing materials, calcium carbonate and coke, are charged into the blast furnace to form within the furnace layers of iron oxide bearing materials, calcium carbonate and coke and wherein air is passed upwardly through said layers, and said coke is burned to heat said materials and reduce iron oxides to produce molten iron, said charge materials having an alkali metal oxide content exceeding 1 pound per ton of molten iron produced, the improvement which includes charging into said blast furnace in addition to said iron oxide materials from 0.25 to 5 percent of olivine, said percentage being based on the weight of said iron oxide materials.

3,966,457

METHOD OF OPERATING A BLAST FURNACE USING COAL AUXILIARY COMBUSTIBLE

Raymond Limpach, Huncherange, and Lucien Lorang, Differdange, both of Luxemburg, assignors to Acieries Reunies de Burbach-Eich-Dudelange S A. ARBED, Luxembourg, Luxembourg

Filed Dec. 5, 1975, Ser. No. 638,159
Claims priority, application Luxembourg, Dec. 6, 1974, 71434
Int. Cl.[2] C21B 5/00
U.S. Cl. 75—42 10 Claims



1. In a method of operating a blast furnace wherein hot gas rises countercurrent to a descending column of coke and iron ore to smelt the ore and burn the coke, the improvement comprising the steps of sequentially:

introducing a carbonaceous combustible granulate containing a vaporizable component into a chamber separate from said blast furnace,

rapidly heating said granulate in said chamber to a temperature sufficiently high to vaporize said component and explode said granulate into fine particles, and

conducting said particles from said chamber into said furnace.

3,966,458

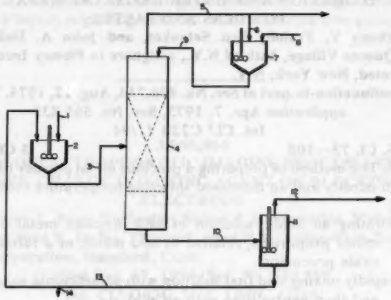
SEPARATION OF ZIRCONIUM AND HAFNIUM

Donald R. Spink, Waterloo, Canada, assignor to Amax Specialty Metal Corporation, Greenwich, Conn.

Filed Sept. 6, 1974, Ser. No. 503,724
Int. Cl.[2] C22B 61/02
U.S. Cl. 75—84.5 13 Claims

1. A continuous process for the separation of the tetrahalides of hafnium and zirconium comprising dissolving a crude feed consisting essentially of hafnium tetrahalide and zirconium tetrahalide in a solvent comprising a near eutectic mixture of zirconium tetrahalide and at least one alkaline metal halide selected from the group consisting of sodium, potassium and lithium to form a first solution, introducing said first solution of an elevated temperature into a distillation tower, withdrawing hafnium tetrahalide vapor from the said solution as the overhead product, adding at least one alkaline metal halide selected from the group consisting of sodium, lithium and potassium to a portion of said hafnium tetrahalide vapor at an elevated temperature to form an eutectic second solution, introducing said second solution into the distillation tower as a reflux, withdrawing an eutectic third solution of zirconium tetrahalide and at least one alkaline metal halide selected from the group consisting of sodium, potassium and lithium as a bottoms fraction from said distillation tower, and separating from said third solution a portion of zirconium tetrahalide.

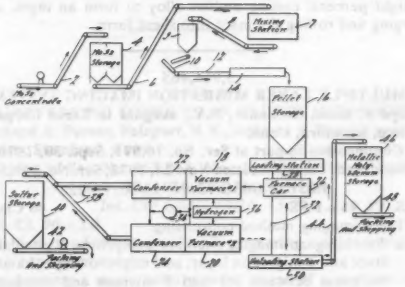
10. A continuous process for the separation of the tetrahalides of hafnium and zirconium and for the production of pure zirconium metal comprising mixing crude zirconium tetrachloride containing hafnium tetrachloride with sodium chloride and potassium chloride to form an eutectic salt containing about 65 mole percent zirconium tetrachloride and hafnium tetrachloride, about 29 mole percent potassium chloride and about 8 mole percent sodium chloride, melting the mixture at a temperature less than about 220°C to form a molten salt mixture, feeding the molten salt mixture to a distillation tower and withdrawing pure hafnium tetrachloride vapor as an overhead product, removing a bottoms product from said tower comprising a molten hafnium-free salt containing about 85 percent by weight zirconium tetrachloride, heating said bottoms product to remove a portion of the pure zirconium tetrachloride, reducing said pure zirconium tetrachloride with magnesium to provide pure zirconium metal, recycling the remainder of the bottoms product to said eutectic salt and combining a portion of the hafnium tetrachloride overhead product with a mixture of sodium chloride and potassium chloride to form an eutectic reflux which is introduced to said column.



3,966,459
PROCESS FOR THERMAL DISSOCIATION OF MOLYBDENUM DISULFIDE

Donald O. Buker, Denver, Colo., assignor to Amax Inc., New York, N.Y.

Filed Sept. 24, 1974, Ser. No. 508,848
Int. Cl.² C22B 34/00, 9/14
U.S. Cl. 75—84 16 Claims

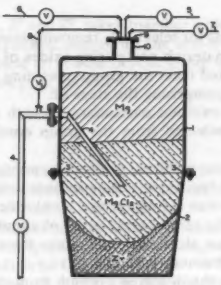


1. A process for preparing metallic molybdenum of relatively high purity which comprises the steps of agglomerating a feed material consisting essentially of a finely-particulated molybdenite concentrate consisting predominantly of molybdenum disulfide into a plurality of shape-sustaining pellets, heating said pellets to an elevated temperature ranging from about 2,500°F to about 3100°F for a period of time sufficient to effect a dissociation of substantially all of the molydenum disulfide contained therein while in a non-oxidizing atmosphere under a pressure of less than about 10 torr, continuously withdrawing the gaseous sulfur and other volatile contaminating constituents in said pellets, heat treating the residual said pellets by subjecting them to contact with hydrogen at an elevated temperature ranging from at least about 2500°F to about 3100°F in a manner to effect a further extraction of residual sulfur to a level less than about 100 ppm by a conversion thereof to hydrogen sulfide and continuously withdrawing the gaseous products thus obtained so as to maintain a pressure of less than about 5 torr, and thereafter cooling and extracting the substantially dense sintered said pellets consisting predominantly of metallic molybdenum.

3,966,460
REDUCTION OF METAL HALIDES

Donald R. Spink, Waterloo, Canada, assignor to Amax Specialty Metal Corporation, Greenwich, Conn.

Filed Sept. 6, 1974, Ser. No. 503,723
Int. Cl.² C22B 34/14; C21C 7/00
U.S. Cl. 75—84.4 2 Claims



1. A process for the production of a metal selected from the group consisting of zirconium and hafnium from its tetrahalide comprising:

a. reducing the metal tetrahalide with a stoichiometric excess of magnesium in a inert atmosphere and at an elevated temperature in a first retort having an upper portion and a lower first crucible portion;

b. withdrawing magnesium halide from said first retort substantially as formed during the reaction while continuously maintaining a protection cover of magnesium chloride over the reduced metal;

c. the said reduced metal being deposited in the first crucible and containing excess magnesium and entrained magnesium chloride;

d. a reaction vessel having an upper portion and a lower portion;

e. removing said first crucible from the first retort and placing it inverted in the upper portion of said reaction vessel;

f. inserting in the lower portion of the reaction vessel a second retort having an upper portion and a lower second crucible portion;

g. heating the upper portion of the reaction vessel and vacuum distilling off the excess magnesium and entrained magnesium halide from the reduced metal in the first crucible;

h. maintaining the lower portion of the reaction vessel at a lower temperature to condense the vapors of magnesium and magnesium chloride;

i. passing the magnesium and magnesium chloride into the second retort from the first crucible; and

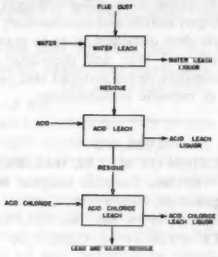
j. employing said second retort in a subsequent reduction of said metal halides as in step (a) above.

3,966,461

SELECTIVE REMOVAL OF BISMUTH FROM OXIDIZED PARTICULATE MATERIALS

Jan D. Miller, and Juan Luis Sepulveda Jimenez, both of Salt Lake City, Utah, assignors to The University of Utah, Salt Lake City, Utah

Filed Mar. 17, 1975, Ser. No. 559,119
Int. Cl.² C22B 30/06
U.S. Cl. 75—101 R 5 Claims



1. A process for selectively removing bismuth from oxidized particulate materials comprising oxides of at least one of the metals selected from the group consisting of lead and silver, the process comprising the steps of:

obtaining oxidized particulate bismuth material including metals selected from the group consisting of lead and silver;

leaching the oxidized particulate material with an acidic chloride leach comprising sulfuric acid having an acidity greater than 0.1 Molar and a chloride ion concentration within the range on the order of about 0.05 to 0.2 Molar and at an elevated temperature thereby selectively dissolving bismuth; and

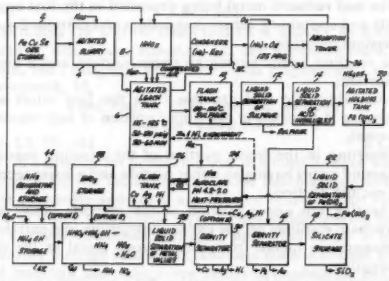
separating the dissolved bismuth from the material.

3,966,462

RECOVERY OF NITRIC ACID SOLUBLE TRANSITION METALS FROM SULFUR AND IRON CONTAINING ORES OF THE SAME

John G. Posel, Everett; Gregory P. Williams, Montlake Terrace, and David N. Nilsen, Everett, all of Wash., assignors to International Ore Technology, Inc., Everett, Wash.

Filed Apr. 18, 1975, Ser. No. 569,227
Int. Cl.² C22B 15/08
U.S. Cl. 75—101 BE 7 Claims



1. In the process of recovering copper from a sulfur and iron containing ore of the same, the steps of forming an aqueous nitric acid leach solution of the ore, heating the solution under containment to a temperature at or above the melting point of sulfur to establish an iron content of no greater than 15 grams of iron values per liter in the leach liquor, adding an acid neutralizer to the liquor to establish a pH of about 1–2 therein and to produce salts of the acid which are soluble in the liquor, contacting the liquor with a copper specific aqueous insoluble organic extractant liquid while maintaining the foregoing pH in the liquor to extract the copper into the extractant liquid, relatively separating the organic extractant liquid and the liquor, and recovering the copper from the organic extractant liquid.

3,966,463

OXIDATION AND SINTER-RESISTANT METAL POWDERS AND PASTES

Anthony V. Fraioli, East Setauket, and John A. DeRosa, Queens Village, both of N.Y., assignors to Plessey Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 496,714, Aug. 12, 1974. This application Apr. 7, 1975, Ser. No. 565,835
Int. Cl.² C22B 11/04
U.S. Cl. 75—108 3 Claims

1. The method of preparing a precious metal powder having high density and an increased sintering temperature comprising:

forming an acidic solution of said precious metal and a minor proportion, relative to said metal, of a refractory oxide precursor;

rapidly mixing said first solution with an ammonia solution, and then neutralizing with an acid;

dissolving sodium acetate in said solution;

adding sufficient sodium bisulfite, under conditions of agitation, to drop the pH of the solution to about 4, and precipitate said precious metal and oxide; and

recovering, drying and purifying said precipitate.

3,966,464

ELECTRICAL CONTACT MATERIALS AND METHODS OF MAKING THE SAME

Terrence Ardern Davies, Horton, England, assignor to Square D Company, Park Ridge, Ill.

Division of Ser. No. 384,157, July 30, 1973, Pat. No. 3,857,706. This application Nov. 25, 1974, Ser. No. 526,889
Claims priority, application United Kingdom, Aug. 25, 1972, 39666/72
Int. Cl.² C22C 5/06, 1/03
U.S. Cl. 75—173 R 1 Claim

1. A method of producing an electrical contact material including the steps providing a silver-mercury master alloy of a desired composition; adding the master alloy to molten silver under an inert atmosphere to provide a silver-based molten alloy having a mercury concentration of not more than 3.0 weight percent; casting molten alloy to form an ingot; and forging and rolling the ingot into sheet form.

3,966,465

MULTIPLE LAYER MIGRATION IMAGING SYSTEM

Lloyd F. Bean, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 76,891, Sept. 30, 1970, abandoned. This application Nov. 24, 1972, Ser. No. 309,546
Int. Cl.² G03G 13/04, 13/06, 13/22
U.S. Cl. 96—1 PS 46 Claims

1. An imaging method comprising:

a. Providing an imaging member comprising a circulation layer and a migration layer; said migration layer having a thickness between 0.5 and 5 microns and comprising migration material and electrically insulating softenable material capable of having its resistance to migration of migration material decreased sufficiently to allow migration of migration material in depth in said migration layer softenable material; said circulation layer having a thickness between 1 and 12 microns and comprising electrically insulating softenable material capable of being soft-

ened sufficiently to allow circulation thereof in response to a charge density;

b. Electrically latently imaging said imaging member to form an electrical latent image of a pre-determined charge density;

c. Developing said electrical latent image to creat an image by decreasing the resistance to migration of migration material in depth in the migration layer softenable material at least sufficient to allow image-wise migration of migration material at least in depth in said migration layer softenable material, and by softening the circulation layer softenable material sufficient to allow circulation thereof in response to said pre-determined charge density wherein migrating material is accumulated into groups.

3,966,466
PHOTOELECTROPHORETIC IMAGING PROCESS USING DARK CHARGE INJECTING AGENT ON BLOCKING ELECTRODE

Geoffrey A. Page, Rochester; Steven J. Grammatica, Webster, and Joan R. Ewing, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 17, 1974, Ser. No. 533,552
Int. Cl.² G03G *5/12, 13/01, 13/24*
U.S. Cl. 96—1.2 **18 Claims**

1. A photoelectrophoretic imaging process comprising the steps of providing a suspension of electrically photosensitive pigment particles in an electrically insulating carrier liquid placed between a conductive electrode and a blocking electrode, at least one of said electrodes being at least partially transparent to electromagnetic radiation to which at least a portion of said pigment particles are sensitive and said blocking electrode being coated with a dark charge injecting agent, said agent being a compound selected from the group consisting of inorganic salts of lithium, iodine, tin and iron, said dark charge injecting agent on said blocking electrode being capable of causing said pigment particles to be substantially uniformly attracted to said conductive electrode when an electrical field is applied across said suspension in the dark, subjecting said suspension to an electrical field in the dark while in contact with said dark charge injecting agent whereby said pigment particles are substantially uniformly attracted to said conductive electrode, and exposing said suspension to an imagewise pattern of electromagnetic radiation to which at least a portion of said pigment particles are sensitive until an image is formed.

3,966,467
TRANSFERRING TONER TO AN HYDROCARBON SHEET

Richard A. Parent, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 465,964, May 1, 1974. This application Apr. 17, 1975, Ser. No. 569,138
Int. Cl.² G03G *13/16, 13/22*
U.S. Cl. 96—1.4 **6 Claims**

1. A method of xerographically preparing a color transparency copy comprising:

a. forming a single color powder image of a multicolored original to be reproduced;

b. transferring the powder image to a transparency comprising a thermoplastic film sheet, said sheet having at least one surface coated with a long chain aliphatic hydrocarbon having a melting point of above 40°C., the hydrocarbon coating having a thickness of above 0.1 mil; and

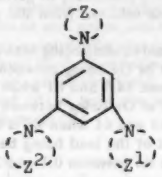
c. fixing the powder image on the transparency.

3,966,468
ORGANIC PHOTOCONDUCTORS WITH TRIAMINO BENZENE ADDITIVES

Lawrence E. Contois, and Norman G. Rule, both of Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,469
Int. Cl.² G03G *5/06*
U.S. Cl. 96—1.5 **16 Claims**

1. An organic photoconductive insulating compositon comprising at least one organic photoconductor and, as a contrast-modifying agent, a compound having the formula:

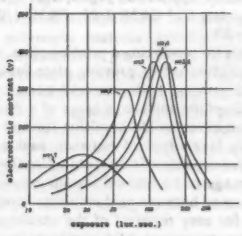


wherein each of Z, Z^1 and Z^2, taken together with the nitrogen to which each is attached, represents the non-metallic atoms necessary to complete an N-deterocyclic group having from 5 to 10 atoms in the cyclic nucleus.

3,966,469
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE COMPOSITION EMPLOYING A PREPOLYMER OF DIALLYLPHTHALATE

Makoto Kuroda, Hirakata; Kazuhisa Morimoto, Settsu, and Akira Minobe, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sept. 10, 1974, Ser. No. 504,990
Claims priority, application Japan, Sept. 14, 1973, 48-104371
Int. Cl.² G03G *5/07*
U.S. Cl. 96—1.5 **5 Claims**



1. A photosensitive composition for electrophotography comprising an organic photosensitive compound which is poly-N-vinylcarbazole or halogenated poly-N-vinylcarbazole and a prepolymer of diallylphthalate, the proportions of the organic photosensitive compound to said prepolymer being 100 parts by weight of organic photosensitive compound to 20 to 100 parts by weight of said prepolymer.

3,966,470

PHOTO-CONDUCTIVE COATING CONTAINING Ge, S, AND Pb OR Sn

Adalbert Feltz; Johannes Opfermann; Bernd Voigt, all of Jena, and Walter Seliger, Dresden, all of Germany, assignors to VEB Pentacon Dresden, Dresden, Germany

Filed June 3, 1974, Ser. No. 475,381

Claims priority, application Germany, Aug. 22, 1973, 173134

Int. Cl.² G03G 5/04; H01J 39/00

U.S. Cl. 96—1.5 2 Claims

1. A photoconductive material comprising a carrier and a homogeneous, vitreous coating thereon, said coating comprising an alloy consisting essentially of germanium, sulphur and a further constituent selected from the group consisting of lead and tin,

the thickness of said coating being between 0.2 and 200μm,

the atom percent of Ge being between 17.7 and 42.5 and that of S between 54.5 and 61 when lead is used,

the atom percent of Ge being between 21 and 41 and that of S between 53 and 61 when tin is used,

the atom percent of the lead being between 0.1 and 24.5 and that of the tin between 0.1 and 22.

3,966,471

ELECTRO PHOTOSENSITIVE MATERIALS WITH A PROTECTIVE LAYER

Haruo Hasegawa; Hiroyoshi Taniguchi; Shiro Yamane; Takao Igawa, and Tomoshi Nagayama, all of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1974, Ser. No. 536,296

Claims priority, application Japan, Dec. 25, 1973, 49-4025

Int. Cl.² G03G 5/04, 5/08

U.S. Cl. 96—1.5 2 Claims

1. A photosensitive material comprising a conductive support at least one surface of which is coated with a photoconductive layer, the said photoconductive layer in turn being coated on the top surface thereof with a protective coating comprising from 0.1 to 50% by weight based on the total weight of the protective coating with an organic compound selected from the group consisting of aluminum alcoholates and aluminum chelate compounds dispersed in a resin.

3,966,472

PROCESS FOR PRODUCING PRINTING PLATES

Kikuo Kubotera, and Eiichi Mizuki, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 4, 1973, Ser. No. 347,762

Claims priority, application Japan, Apr. 5, 1972, 47-34265

Int. Cl.² G03F 7/02; G03C 1/90

U.S. Cl. 96—33 8 Claims

1. A process for producing a printing plate, which comprises exposing a photosensitive printing plate material through an original, said printing plate material consisting of a support having an oleophilic surface, a layer of a direct positive-type photosensitive silver halide emulsion formed on said support, a hydrophilic layer applied between said support and said emulsion layer capable of being etch-bleached corresponding to a silver image to be formed in said emulsion layer and an interlayer formed between said emulsion layer and said hydrophilic layer for easy removal of the emulsion layer after the etch-bleaching treatment, said interlayer being etch-bleachable along with the hydrophilic layer and being removable after etch-bleaching with said emulsion layer, said interlayer being removable from said hydrophilic layer by immersion in water of 30°–50° C; developing the exposed material to form a silver image in the non-exposed areas in said emulsion layer; subjecting the developed material to an etch-bleaching treatment to remove the interlayer and hydrophilic layer at a portion corresponding to the silver image in the non-exposed areas and to reveal the oleophilic surface of the support; and removing the interlayer and the emulsion layer at the exposed portion on which the silver image is not formed, thereby to reveal said hydrophilic layer.

3,966,473

METHOD FOR PRODUCING A PHOTOMASK

Masamichi Sato, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 9, 1974, Ser. No. 513,435

Claims priority, application Japan, Oct. 9, 1973, 48-113630

Int. Cl.² G03C 5/00; C09K 13/08; C23F 1/02; G03B 27/00

U.S. Cl. 96—36 14 Claims

1. A method for producing a photomask, which comprises exposing and development-processing a photographic light-sensitive material consisting essentially of a transparent support having thereon a masking layer and a silver halide emulsion layer to thereby form silver image areas, said emulsion layer being formed by dispersing silver halide in a water soluble binder, etch-bleaching said silver halide emulsion layer to thereby remove the silver image areas to uncover the masking layer thereunder, subjecting the support, masking layer and remaining non-silver image areas of the emulsion layer to etching to etch the uncovered masking layer with a mixed solution containing hydrofluoric acid and ammonium fluoride to thereby uncover the transparent support thereunder without permeation of the mixed solution etchant through the non-silver image areas of the emulsion layer, and then removing the non-silver image areas of the emulsion layer to thereby reveal the masking layer.

3,966,474

METHOD FOR IMPROVING ADHERENCE OF PHOSPHOR-PHOTOBINDER LAYER DURING LUMINESCENT-SCREEN MAKING

Stanley Arthur Harper, New Providence, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 25, 1974, Ser. No. 527,055

Int. Cl.² G03C 5/00

U.S. Cl. 96—36.1 10 Claims

1. A method for preparing a luminescent screen upon a glass surface comprising

a. adhering to said glass surface a dry, non-photosensitive precoating consisting essentially of discreet water-insoluble, organic, polymeric particles, said precoating having a weight of about 0.08 to 0.80 milligrams per square centimeter,

b. depositing upon said precoating a layer of a slurry comprising phosphor particles and a photosensitive binder therefor,

c. exposing said coating to a light image whereby to form in said coating selected regions of greater solubility and selected regions of lesser solubility,

d. and then developing said exposed coating by selectively removing said regions of greater solubility.

3,966,475

PHOTOGRAPHIC SILVER HALIDE EMULSIONS CONTAINING ACYLACETANILIDE COLOR COUPLERS

Raphael Karel Van Poucke, Berchem, and Freddy Carolus Baeyens, Wommelgem, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

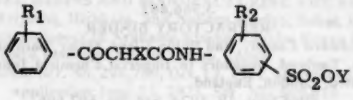
Filed Mar. 18, 1974, Ser. No. 452,327

Claims priority, application United Kingdom, Apr. 6, 1973, 16625/73

Int. Cl.² G03C 7/00

U.S. Cl. 96—55 6 Claims

1. Method of producing a yellow colored photographic image in a photographic light-sensitive silver halide material comprising exposing a photographic light-sensitive silver halide material and developing it with an aromatic primary amino color developing agent in the presence of a benzoylacetanilide color coupler having the formula:



wherein

R_1 represents an alkoxy group,

R_2 represents alkoxy,

X represents hydrogen, halogen, a —S—R′ group wherein R′ is an alkyl group, an aryl group or a heterocyclic group, a —O—R″ group wherein R″ represents an alkyl group or an aryl group, or an acyl group, and

Y represents a carbocyclic aryl group.

3,966,476

SPECTRALLY SENSITIZED SILVER HALIDE EMULSION CONTAINING MORE THAN 50% OF THE GRAINS WITH RIPENING NUCLEI IN CAVITIES

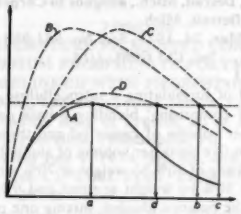
Manfred Becker, Leverkusen, Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Feb. 11, 1974, Ser. No. 440,976

Claims priority, application Germany, Feb. 9, 1973, 2306447

Int. Cl.² G03C 1/28, 1/08

U.S. Cl. 96—107 **2 Claims**



1. A photographic material containing at least one light-sensitive spectrally sensitized silver halide emulsion layer, wherein the emulsion contains silver halide grains with ripening nuclei capable of forming developable latent image nuclei upon exposure and being developable after exposure in the surface developer of the following composition:

Water	800 ml
p-methylaminophenol	2.4 g
ascorbic acid	10.0 g
sodium carbonate	10.0 g
potassium bromide	2.0 g
made up with water to	1 liter

wherein the improvement comprises more than 50% of the grains in the emulsion contain ripening nuclei which are in cavities within the silver halide grains which cavities are open to the outside of the surface of the grains.

3,966,477

SPECTRALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSION

Masanao Hinata; Haruo Takei; Tadashi Ikeda; Akira Ogawa; Akira Sato, and Atsuo Iwamoto, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

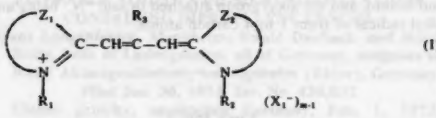
Filed Dec. 6, 1974, Ser. No. 530,100

Claims priority, application Japan, Dec. 6, 1973, 48-138346

Int. Cl.² G03C 1/14

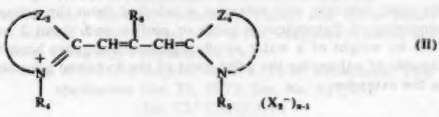
U.S. Cl. 96—124 **16 Claims**

1. A silver halide photographic emulsion containing, in combination, supersensitizing amounts of (A) at least one sensitizing dye of the following formula (I)



(I)

wherein Z_1 represents an atomic group required for forming a benzimidazole ring or a β-naphthimidazole ring; Z_2 represents an atomic group required for forming a benzoxazole ring or a β-naphthoxazole ring; R_1 and R_2 each represents an aliphatic group with at least one or R_1 and R_2 representing an alkyl group having a carboxy group or an alkyl group having a sulfo group; R_3 represents a hydrogen atom or an alkyl group; X_1 represents an acid anion; and m is 1 or 2, and when m is 1 the dye forms an intramolecular salt, wherein the benzimidazole ring formed by Z_1, is substituted in the 5 position with a halogen atom, an alkylcarbonyl group, or an alkoxy carbonyl group, and (B) at least one sensitizing dye of the following general formula (II)



(II)

wherein Z_3 represents an atomic group required for forming a benzoxazole ring or a β-naphthoxazole ring; Z_4 represents an atomic group required for forming a benzothiazole ring, a benzoselenazole ring, a β-naphthothiazole ring or a β-naphthoselenazole ring; R_6 represents a hydrogen atom or an alkyl group; R_4 and R_5 each represents an aliphatic group with at least one of R_4 and R_5 representing an alkyl group having a carboxy group or an alkyl group having a sulfo group; X_2 represents an acid anion; and n is 1 or 2, and when n is 1 the dye forms an intramolecular salt.

3,966,478

N,N-DIALKYL O,O-BIS(HALOALKYL)PHOSPHORAMIDATE FLAME RETARDANT

Arthur D. F. Toy, Stanford, Conn., and Kenneth L. Eilers, Irvington, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 69,157, Sept. 2, 1970, abandoned. This application July 21, 1972, Ser. No. 274,033

Int. Cl.² C08J 3/20

U.S. Cl. 106—15 FP **8 Claims**

1. A fire retardant composition comprising, in intimate admixture, a polymeric material selected from the group consisting of polyurethanes, cellulosics, polyolefins, polyesters, vinyl polymers, polyacrylics, polyethers, polyacetals, polyphenolics, and rubber in combination with and as a fire retardant therefor, a haloalkyl N,N-dialkylphosphoramidate selected from the group consisting of 2,3-dihalopropyl N,N dialkylphosphoramidates and 2-(1,3-dihalopropyl) N,N-dialkylphosphoramidates wherein said halo substituent is selected from the group consisting of chloro and bromo, and the alkyl group attached to said "N" being an alkyl radical of from 1 to 4 carbon atoms.

8. In a process for preparing fire retardant polymer compositions which comprise, in intimate admixture, a polymer selected from the group consisting of polyurethanes, cellulosics, vinyl polymers, polyolefins, polyesters, polyethers, polyacetals, polyepoxies, polyphenolics, and rubber, and a fire retardant compound, the improvement which comprises adding, as said fire retardant an effective amount of a haloalkyl N,N-dialkylphosphoramidate selected from the group consisting of 2,3-dihalopropyl N,N dialkylphosphoramidates and 2-(1,3dihalopropyl) N,N-dialkylphosphoramidates wherein said halo substituent is selected from the group consisting of chloro

and bromo, and the alkyl group attached to said "N" being an alkyl radical of from 1 to 4 carbon atoms.

3,966,479

DENTAL INVESTMENT MATERIAL

Francis Frederick Koblitz, York, Pa., assignor to Dentsply Research & Development Corporation, Milford, Del.

Filed Feb. 27, 1973, Ser. No. 336,393
Int. Cl.² B28B 7/28
U.S. Cl. 106—38.5 R 2 Claims

1. A microscopically foraminous solid dental molding composition having a fracture strength under compression of from between about 100psi to about 500psi comprising uniformly distributed therethrough about 30 to 45% by weight of a substantially completely hydrated calcined gypsum, about 30 to 55% by weight of chemically uncombined water, about 5 to 20% by weight of an extender capable of maintaining the chemically uncombined water evenly distributed throughout the solid, wherein said extender is selected from the group consisting of diatomaceous earth or perlite; and about 3 to 10% by weight of a water swollen glutinous organic binder capable of enhancing the adherence of the hydrated gypsum to the extender.

3,966,480

LOW DENSITY SLEEVE

James D. Evans, Johnstown, Pa., assignor to Swank Refractories Company, Inc., Johnstown, Pa.

Filed Dec. 30, 1974, Ser. No. 537,063
Int. Cl.² C04B 21/06
U.S. Cl. 106—40 R 4 Claims

1. A low density refractory clay stopper rod sleeve having a substantially imperforate surface and a core containing a plurality of randomly spaced internal and discontinuous small voids, said bulk density of the sleeve being less than 2.0 gr./cc.

3,966,481

FIBERIZABLE ALKALI-RESISTANT E-TYPE GLASS

Alan W. Atkinson, and Brian P. Hodgson, both of Rochdale, England, assignors to Turner & Newall Limited, Manchester, England

Continuation of Ser. No. 450,231, March 11, 1974, abandoned. This application June 30, 1975, Ser. No. 592,034
Claims priority, application United Kingdom, Mar. 12, 1973, 11783/73
Int. Cl.² C03C 3/08, 13/00
U.S. Cl. 106—54 6 Claims

1. A fiberizable glass composition exhibiting improved alkali resistance consisting essentially, by weight, of

SiO_2	46 to 56%
B_2O_3	7 to 12%
R_2O_3	12 to 17% (Fe_2O_3 less than 1%)
CaO	13 to 24%
MgO	0 to 6%
F	0 to 1%
R_2O	less than 1%
ZrO_2	2 to 6%
TiO_2	0 to 6%

wherein R_2O_3 is Al_2O_3 with less than 1% Fe_2O_3 and minor amounts of similar oxides, and R_2O is Li_2O, Na_2O, K_2O or a mixture of at least two thereof, said glass composition having improved alkali resistance compared to a similar composition absent titania and zirconia, wherein CaO plus MgO does not exceed 25%, and ZrO_2 plus TiO_2 does not exceed 8%.

3,966,482

REFRACTORY BINDER

John Edward Cassidy, and Philip Glenn Millar, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sept. 19, 1974, Ser. No. 507,606
Claims priority, application United Kingdom, Sept. 28, 1973, 45432/73
Int. Cl.² C04B 35/02
U.S. Cl. 106—64 16 Claims

1. A binder suitable for use in the binding of non-basic refractory aggregate and comprising a mixture of a calcium aluminate and a water-soluble aluminium phosphate, in which the calcium aluminate has the empirical formula x CaO. y Al_2O_3, where x:y is in the range 3:1 to 1:5 and wherein the molar ratio of P_2O_5 in the aluminium phosphate to CaO in the calcium aluminate is in the range 0.05:0.7.

3,966,483

METHOD OF FORMULATING SOLUTION CONTAINING DISPERSED NITROCELLULOSE

Jack W. Albright, Detroit, Mich., assignor to Carpenter Chemical Company, Detroit, Mich.

Filed Mar. 24, 1975, Ser. No. 561,088
Int. Cl.² C08L 1/18
U.S. Cl. 106—171 1 Claim

1. The method of formulating a nitrocellulose based skin covering material comprising: blending a base consisting of about one part per volume of castor oil and three parts per volume of ether in five parts per volume of alcohol; preparing a thickener consisting of 30% by weight of 70% nitrocellulose solids with about 50% by weight acetone and 9% by weight plasticizer, with the balance alcohol; mixing one part by volume thickener to about three parts per volume of the base; and mixing 1 gallon part by volume of 70% nitrocellulose into the combined base and thickener.

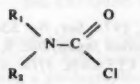
3,966,484

COMPOSITION FOR SIZING CELLULOSE FIBERS

Karin Ulla Elisabet Helmer, Solna, and Alf Ragnar Reuterhall, Gustavsberg, both of Sweden, assignors to Kemanord Aktiebolag, Stockholm, Sweden

Division of Ser. No. 271,858, July 14, 1972, Pat. No. 3,887,427. This application Mar. 24, 1975, Ser. No. 561,562
Int. Cl.² D21D 3/00; C07C 125/03
U.S. Cl. 106—287 R 4 Claims

1. A sizing agent for material containing cellulosic fibers comprising an aqueous dispersion of an effective emulsifying amount of an emulsifier and a carbamoyl chloride having the following general formula



wherein R_1 is an organic, hydrophobic hydrocarbon group containing 8 – 40 carbon atoms and R_2 is hydrogen, lower alkyl or is the same as R_1.

3,966,485

NOVEL RESINS AND MANUFACTURING THE SAME

Junji Ariyoshi, Hirakata, and Noboru Kariya, Sakai, both of Japan, assignors to Arakawa Rinsan Kagaku Kogyo Kaisha and Nard Institute, both of Osaka, Japan

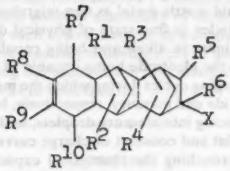
Division of Ser. No. 296,780, Oct. 12, 1972, abandoned. This application June 23, 1975, Ser. No. 589,014

Claims priority, application Japan, Oct. 13, 1971, 46-80794; Oct. 21, 1971, 46-83774

Int. Cl.² C07C *61/12*, *63/52*; C07G *17/00*

U.S. Cl. 106—287 R 4 Claims

1. A resin having a formula of



wherein each of R^1, R^2, R^3, R^4, R^5 and R^6 is hydrogen or methyl group, each of R^7, R^8, R^9 and R^{10} is hydrogen, alkyl group having 1 to 6 carbon atoms or phenyl group and X is —CN or $CONH_2$—

3,966,486

HIGH TEMPERATURE PIGMENTED COATINGS BASED ON ZIRCONIUM PHOSPHINATE POLYMER BINDERS CROSSLINKED WITH PHOSPHINIC ACIDS

James Ping King, Lansdale; Joseph Simkin, Lafayette Hill, and Peter F. Radice, King of Prussia, all of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed July 1, 1974, Ser. No. 484,523

Int. Cl.² C08L *85/02*; C09K *3/00*

U.S. Cl. 106—287 R 7 Claims

1. A composition comprised of a mixture of a zirconium phosphinate polymer of the repeating unit $Zr(OH)_x(OPRR^1O)_y$, a phosphinic acid of the formula $R^2R^3P(O)OH$, where R, R^1, R^2 and R^3 are independently selected from the group consisting of alkyl, aryl, alkoxyl, and aryloxyl radicals, having 1 to 12 carbons and a pigment selected from the grou consisting of aluminum, zinc, the alkali metal and alkaline earth metal titanates, zinc oxide, magnesium oxide, and the alkali metal and alkaline earth metal silicates, there being in the composition from about 25 to about 75 parts by weight of the phosphinic acid and from about 230 to about 330 parts by weight of the pigment per 100 parts by weight of the zirconium phosphinate polymer.

3,966,487

PYROLIZATION

Grant Crane, and Edward Leo Kay, both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 236,169, March 20, 1972, abandoned. This application May 24, 1974, Ser. No. 473,014

Int. Cl.² C09C *1/44*, *1/48*

U.S. Cl. 106—307 2 Claims

1. The process of producing carbon black from scrap tires which comprises separating the tire treads from other parts of the tires so as to obtain scrap rubber composed essentially of tread stock and substantially free of other rubber stock, calcining said scrap rubber in the substantial absence of air and reducing the particle size of the char obtained and thus producing a char which is suitable for use as a carbon black for compounding in tire tread stock.

3,966,488

FLOWABLE AQUEOUS PIGMENT FORMULATIONS CONTAINING DIPROPYLENE GLYCOL

Hans Langenfelder, Mannheim; Ewald Daubach, and Horst Belde, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 30, 1974, Ser. No. 438,032

Claims priority, application Germany, Feb. 1, 1973, 2304978

Int. Cl.² C04B *31/40*

U.S. Cl. 106—308 Q 9 Claims

1. An aqueous pigment composition having improved flow, said composition consisting essentially of

a. water,

b. a water-insoluble pigment,

c. a water-soluble dispersing agent and

d. from 5 to 35% by weight of dipropylene glycol based on the total weight of the composition.

3,966,489

METHOD OF DECOLORIZING SUGAR SOLUTIONS WITH HYBRID ION EXCHANGE RESINS

James Henry Barrett, Neshaminy Valley, and David Henry Clemens, Willow Grove, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 26,046, April 6, 1970, abandoned. This application Dec. 21, 1973, Ser. No. 427,402

Int. Cl.² C13D *3/14*

U.S. Cl. 127—46 A 4 Claims

1. A method of decolorizing sugar solutions which comprises contacting the solution with a hybrid ion exchange resin in which the resin has anionic exchange activity, said hybrid ion exchange resin being based on a hybrid copolymer comprising a cross-linked macroreticular porous host or base copolymer of a polyunsaturated monomer and a monoethylenically unsaturated monomer, said macroreticular copolymer being at least partially filled with a cross-linked gel copolymer of a polyunsaturated monomer and a monoethylenically unsaturated monomer, the gel copolymer or phase being present in the amount of about 5 to 300 parts by weight per 100 parts by weight of macroreticular host polymer or phase.

3,966,490

ELECTROCHEMICAL CELL

James J. Auborn, Groton, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 15, 1975, Ser. No. 605,130

Int. Cl.² H01M *1/02*, *35/00*, *43/06*

U.S. Cl. 136—6 LN 17 Claims

1. An electrochemical cell comprising an alkali metal anode; an electronically conducting cathode material, a nonaqueous electrolytic solution comprising an inorganic solvent selected from the group consisting of phosphorus oxychloride, thionyl chloride, sulfuryl chloride, and mixtures thereof, and a solute dissolved in said solvent; said anode, cathode and electrolyte being housed in a container the inner surface of which is an oxide of a material selected from the group consisting of aluminum, magnesium, and titanium and alloys thereof.

3,966,491

MOLTEN SALT ELECTROCHEMICAL SYSTEMS FOR BATTERY APPLICATIONS

Gleb Mamantov, Knoxville, Tenn.; Roberto Marassi, Camerino, Italy, and James Q. Chambers, Concord, Tenn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 13, 1975, Ser. No. 549,578

Int. Cl.² H01M *10/00*

U.S. Cl. 136—6 LI 6 Claims

1. An electrochemical system comprising an aluminum anode, a cathode spaced from said anode where said cathode

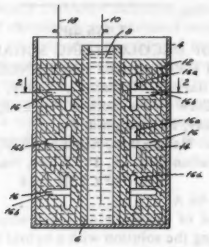
comprises positive oxidation states of an element selected from the group consisting of sulfur and iodine and a low melting molten mixture of aluminum chloride and alkali chloride disposed between said anode and said cathode and in contact with each.

3,966,492

SODIUM SULFUR BATTERY OR CELL WITH IMPROVED AMPERE-HOUR CAPACITY

Frank A. Ludwig, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 20, 1975, Ser. No. 605,941
Int. Cl.² H01M 43/00
U.S. Cl. 136—6 FS 12 Claims



1. In a secondary battery or cell comprising:

A. one or more anodic reaction zones containing a molten alkali metal reactant-anode in electrical contact with an external circuit;

B. one or more cathodic reaction zones containing (1) a cathodic reactant which, when said battery or cell is at least partially discharged, is selected from the group consisting of (i) a single phase composition comprising molten polysulfide salts of said anodic reactant and (ii) a two phase composition comprising molten sulfur and molten sulfur saturated polysulfide salts of said anodic reactant and (2) an electrode of porous conductive material which is at least partially immersed in said cathodic reactant; and

C. a cation-permeable barrier to mass liquid transfer interposed between and in contact with said anodic and cathodic reaction zones, said porous conductive material being in electrical contact with both said cation-permeable barrier and said external circuit, wherein the improvement comprises:

a. employing a porous conductive material which will wick both sulfur and alkali metal polysulfides and which, in different regions of said cathodic reaction zone exhibits different degrees of wettability by said alkali metal polysulfide, said material in a region adjacent to said cation-permeable barrier being more readily wetted by said polysulfide than is said material in a region further removed from said barrier such that sulfur will boil near said barrier and condense away from it;

b. disposing said porous conductive material within said cathodic reaction zone such that it forms and encloses one or more channels which extend from said region adjacent said cation-permeable barrier outwardly into the region of said cathodic reaction zone which is further removed from said barrier; and

c. maintaining the amount of molten cathodic reactant within said cathodic reaction zone such that said channels remain free of said molten reactant and are thus adapted to transport sulfur vapor.

3,966,493

RECHARGEABLE MERCURY ELECTRODE

Margarete Jüng, Kelkheim, Taunus, Germany, assignor to Varta Batterie Aktiengesellschaft, Hannover, Germany

Continuation of Ser. No. 23,918, March 30, 1970, abandoned.
This application Dec. 6, 1972, Ser. No. 312,434
Claims priority, application Germany, Apr. 2, 1969, 1916959
Int. Cl.² H01M 35/02
U.S. Cl. 136—20 17 Claims

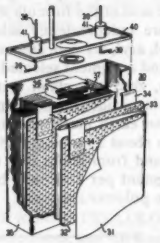
1. A rechargeable electrode having high capacity especially for primary cells and accumulators, which comprises a porous metal matrix having amalgamated thereon a non-pyrophoric amalgam of said matrix metal as non-migratory, non-coalescible, solid particles in fine state of physical distribution, said matrix being inert to alkali and being capable of absorbing hydrogen and the electrode being capable of repeated charging and discharging cycles during which the mercury is present as mercury oxide and mercury, respectively, but in either case without coalescing into mercury droplets, said electrode being capable of a flat and constant discharge curve, with a current discharge approaching the theoretical capacity of the electrode and said matrix being a Raney-metal of one of the following: Raney-nickel, Raney-iron, Raney-cobalt or alloys of these Raney metals.

3,966,494

IMPREGNATION OF ELECTRODES FOR NICKEL CADMIUM BATTERIES

Thomas Denis O'Sullivan, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 21, 1974, Ser. No. 516,791
Int. Cl.² H01M 4/38
U.S. Cl. 136—24 16 Claims



1. A process for the fabrication of nickel cadmium batteries in which the cadmium electrodes are made by a series of steps comprising immersing a porous nickel plaque in a solution with pH between 0.5 and 5.0 which contains cadmium ions and a reducible anion, the redox potential of which is more positive than the redox potential of the cadmium ions, followed by impregnating the plaque by precipitating the hydroxide of the cadmium ions from the solution in the pores of the plaque by electrolytic action at a given current density in the temperature range from 85°C to the boiling point of the solution, characterized in that said solution contains an additional anion selected from the group consisting of chloride, iodide and sulfate with concentration between 10 and 98 mole percent of the total anion concentration.

3,966,495

METHOD FOR THE PRODUCTION OF LEAD STORAGE BATTERY ELECTRODES

Tore Eriksson, Nol, Sweden, assignor to Aktiebolaget Tudor, Sundbyberg, Sweden

Filed Oct. 30, 1974, Ser. No. 519,193

Claims priority, application Sweden, Nov. 1, 1973, 7314903; Nov. 1, 1973, 7314904

Int. Cl.² H01M 4/16

U.S. Cl. 136—27 22 Claims

1. A process for the preparation of positive lead storage battery electrodes wherein an active material comprising lead monoxide dry powder surrounded by a sheath is converted to lead dioxide which consists essentially of immersing an electrode containing such active material in a single forming solution of an alkaline electrolyte having a pH of about 11–13 and thereafter forming the electrode in said electrolyte to convert the active material to lead dioxide.

3,966,496

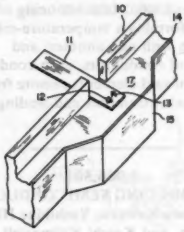
ELECTRODE ASSEMBLY FOR AIR DEPOLARIZED CELLS

Roger W. Kelm, Emerald, Wis., assignor to Gould Inc., St. Paul, Minn.

Continuation of Ser. No. 279,028, Aug. 9, 1972, abandoned. This application Aug. 30, 1974, Ser. No. 502,050

Int. Cl.² H01M 4/00

U.S. Cl. 136—86 A 23 Claims



1. An electrode assembly for an air depolarized cell comprising:

an electrode assembly of predetermined thickness including a current collecting member having openings of a predetermined size, an electrode material dispersed throughout said current collecting member and a first insulating member located on one side of said electrode assembly and a second insulating member located on the second side of said electrode assembly;

an electrical conducting tab for forming a low resistance electrical connection to said current collecting member through said insulating layers, said electrical conducting tab having tines suitable for penetrating through said electrode assembly, and said insulating layers, said electrically conducting tab overlaying one of said insulating layers and spaced from said current collecting member with each of said tines projecting through an opening formed in said electrode assemby by each of said tines, said tines having at least a portion of said tines engaging said current collecting member to thereby form a low resistance electrical connection thereto.

3,966,497

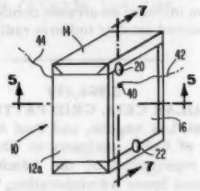
SEAWATER BATTERY

Harold Nickolas Honer, Raleigh, N.C., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Sept. 16, 1974, Ser. No. 506,304

Int. Cl.² H01M 6/34

U.S. Cl. 136—90 13 Claims



5. A galvanic battery comprising a plurality of cells, each cell including a cathode and an anode, the battery being characterized by a first endwall and a second endwall, each endwall having a first and a second opposed edge, a top and a bottom, a plurality of barriers, one barrier separating each adjacent pair of cells, the barriers being composed of a flexible electrically non-conductive material, each barrier having a first face and a second face, a first edge and a second edge, a top and a bottom, the first edge and the second edge of each barrier including a first flange and a second flange extending from a face of the barrier; a cathode on the first face of each barrier and an anode on the second face thereof;

individual means for electrically connecting the cathode on the first face of each barrier with the anode on the second face thereof, each means for connecting, penetrating through the respective cathode, barrier and anode, each means for connecting further providing a means for attaching its respective cathode and anode to the barrier, therebetween,

an adhesively coated tape, the tape overlapping the endwalls of the battery and being adhered thereto, the tape further being adhered to the flanges of at least one side of the battery, the adhesively coated tape and the flanges alone forming at least one sidewall of the battery.

3,966,498

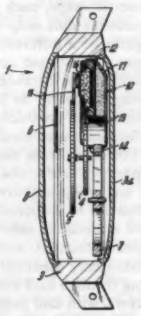
ENERGY CELL CONFIGURATION FOR A TIMEPIECE

Paul Wuthrich, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Nov. 18, 1974, Ser. No. 524,433

Int. Cl.² H01M 2/00

U.S. Cl. 136—166 4 Claims



1. An improved cell for a substantially circular electric

watch movement having a rotatably mounted center wheel, wherein the improvement comprises:

an outer container for said cell having a first arcuate convex sidewall portion with a first uniform radius of curvature and an arcuate beveled portion forming part of the bottom of the cell and connected along the edge of the first sidewall portion,

a second connecting sidewall portion extending between the ends of the first sidewall portion, wherein said second wall portion includes an arcuate concave sidewall portion having a second smaller uniform radius of curvature.

3,966,499

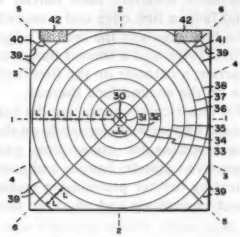
SOLAR CELL GRID PATTERNS

Robert K. Yasui, Los Angeles, and Paul A. Berman, La Crescenta, both of Calif., assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 296,622, Oct. 11, 1972, abandoned. This application Apr. 19, 1974, Ser. No. 462,341

Int. Cl.² H01L *31/02*

U.S. Cl. 136—206 **8 Claims**



1. A solar cell exposable to solar radiation comprising:

a first layer of semiconductive material doped to a first polarity, having a top surface and a bottom surface;

a second layer of material doped to a second polarity opposite said first polarity, having a bottom surface in contact with the top surface of said first layer and a top surface exposable to solar radiation, a point on said top surface defining a center; and

a metallized grid pattern on said second layer top surface and in contact therewith, the pattern including a plurality of electrically conductive metallized spaced apart grids of a preselected geometric shape, each grid being formed of a separate continuous metallic strip defining the boundaries of a plane figures of a different fixed area, and the grids being organized about said center and with equal distances between them, the distance between any pair of adjacent grids being definable as L and a plurality of electrical conductors, each conductor being radially disposed on said surface and in electrical contact with each of said grids and extending from the grid closest to said center to the periphery of said surface whereby the maximum distance of any majority carrier, injected in said semiconductor material in response to the exposure of said semiconductor material to solar radiation, to any of said grids, is not greater than ½L with said metallized grid pattern being substantially identical along an imaginary straight line passing through said center, except for lines along said conductors; with said pattern being located on said second layer top surface so that portions of the surface not covered by said pattern are exposed on either side of each grid and each conductor.

3,966,500

TEMPERATURE-MEASURING DEVICE

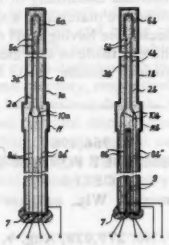
Heinz Brixy, Julich, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Continuation-in-part of Ser. No. 428,352, Dec. 26, 1973. This application Apr. 22, 1974, Ser. No. 463,104

Claims priority, application Germany, Apr. 25, 1973, 2320751

Int. Cl.² G01K *7/30*, *7/04*

U.S. Cl. 136—232 **3 Claims**



1. A temperature-measuring device comprising:

an elongated housing having a closed end;

a body of refractory material in said housing;

a noise-thermometer coil in said housing adjacent said closed end and having a pair of opposite extremities;

a pair of spaced-apart thermocouple elements extending through said body and each forming a thermocouple junction with said noise-thermometer coil at a respective extremity thereof, said elements being of materials which are capable of forming a temperature-measuring thermocouple junction with one another; and

two pairs of pair of conductors, each conductor being connected to one of said elements remote from the junctions thereof with said extremities and leading from said housing.

3,966,501

PROCESS OF PRODUCING SEMICONDUCTOR DEVICES

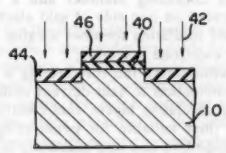
Kousi Nomura; Satoru Kawazu; Yoshihiko Hirose; Isao Inoue; Yoshihiko Watari, and Koichi Kijima, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1974, Ser. No. 451,383

Claims priority, application Japan, Mar. 23, 1973, 48-33191; Mar. 31, 1974, 49-37064; May 18, 1973, 48-55310

Int. Cl.² H01L *21/265*

U.S. Cl. 148—1.5 **12 Claims**



5. A process of producing semiconductor devices as claimed in claim **3**, wherein said substrate is silicon in the form of a single crystal and wherein said charged particles are ions of an element selected from the group consisting of indium, gallium, antimony, tin and arsenic.

3,966,502

ZIRCONIUM RINSE FOR PHOSPHATE COATED METAL SURFACES

Robert Eric Binns, Abington, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Division of Ser. No. 281,357, Aug. 17, 1972, Pat. No. 3,850,732, which is a continuation-in-part of Ser. No. 94,531, Dec. 2, 1970, Pat. No. 3,695,942. This application Sept. 6, 1974, Ser. No. 504,005
Int. Cl.² C23F 7/10
U.S. Cl. 148—6 3 Claims

1. As a composition of matter suitable for rinsing metal surfaces subsequent a conversion coating, an aqueous solution comprising:

1. a water soluble zirconium salt including at least one member selected from the group consisting of zirconium carboxylate, the alkali metal and ammonium salts of fluozirconate, the alkali metal and ammonium salts of a zirconium hydroxycarboxylate, and the zirconium salt of ethylendiaminetetraacetate, wherein said zirconium moiety is present in said solution as the tetravalent ion in a concentration of from about .05 grams to about 3 grams per liter, expressed as zirconium dioxide (ZrO_2) and,
2. at least one member selected from the group consisting of gluconic acid and citric acid and salts thereof in an amount sufficient to solubilize trace minerals present, if any;

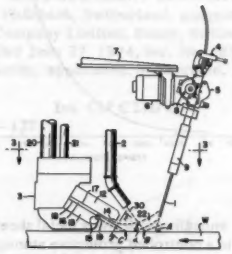
said solution being rendered to a pH of between about 3 to about 8.5.

3,966,503

METHOD FOR MAKING INSTANTANEOUS SCARFING STARTS

Stephen August Engel, Shenorock, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 13, 1975, Ser. No. 540,455
Int. Cl.² B23K 7/08
U.S. Cl. 148—9.5 14 Claims



1. A method for making an instantaneous thermochemical start on the surface of a ferrous metal workpiece comprising the steps of:

a. contacting a preselected spot on said surface where the scarfing reaction is to begin, with the end of a ferrous metal wire which has been preheated to its ignition temperature in an oxygen atmosphere, and simultaneously therewith

b. impinging a high intensity jet of oxygen gas on said surface at a point about 1 to 15 cm. behind said spot, thereby causing an instantaneous scarfing reaction to begin and a molten puddle to form at said spot, and thereafter

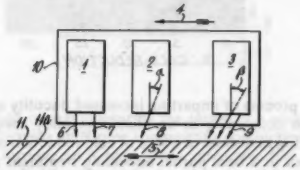
c. continuing the impingement of a high intensity jet of oxygen on said puddle until said puddle has spread to a preselected width.

3,966,504

METHOD AND APPARATUS FOR THERMOCHEMICAL GAS SCARFING

Ladislav Sipek, Taby, and Erik Smars, Rimbo, both of Sweden, assignors to Centro-Maskin i Goteborg AB, Goteborg, Sweden

Filed May 16, 1974, Ser. No. 470,445
Claims priority, application Sweden, May 21, 1973, 7307144
Int. Cl.² B23K 7/06, 7/08
U.S. Cl. 148—9.5 15 Claims



1. A method for initiating and supporting a thermochemical process of scarfing the surface of a workpiece in order to remove surface defects comprising the steps of continuously relatively moving a workpiece having surface defects through a preheating station, a combustion station, and a scarfing station,

preheating at said preheating station a zone of said workpiece to form a molten area of molten material at said zone,

simultaneously combusting at said combusting station a zone of said workpiece which has previously been preheated at said preheating station to combust said molten material and extend said molten area over a predetermined area of said workpiece,

simultaneously scarfing at said scarfing station a zone of said workpiece which has previously been preheated at said preheating station and chemically combusted at said combusting station,

and continuing said steps until a desired degree of scarfing is completed.

3,966,505

HIGH STRENGTH WROUGHT ZINC ALLOY

David L. Dollar, Greeneville, Tenn., assignor to Ball Corporation, Muncie, Ind.

Continuation-in-part of Ser. No. 469,973, May 15, 1974, abandoned. This application Apr. 30, 1975, Ser. No. 573,292
Int. Cl.² C22F 1/16
U.S. Cl. 148—11.5 R 7 Claims

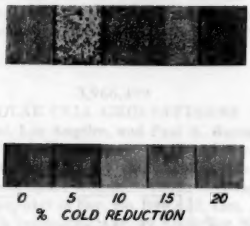
1. A method of manufacturing a stable high strength alloy having mechanical properties greater than 15 percent elongation and a tensile strength greater than 65,000 psi, which comprises subjecting a Zn/Al/Cu/Mg alloy containing from about 20 to 28 percent aluminum, from about 0.1 to 3.5 percent copper, about 0.01 to 0.5 percent magnesium, and the remainder zinc, to a temperature between 550° F., to 750° F., to effect homogenization of the alloy, cooling the homogenized alloy to a rolling temperature of about 350° F., at a rate of about 10° to 50° F., per minute and thereafter rolling the homogenized alloy at a temperature below 350° F., to attain between 10 and 70 percent reduction.

3,966,506

ALUMINUM ALLOY SHEET AND PROCESS THEREFOR

Frank N. Mandigo, North Branford, and Philip R. Sperry, North Haven, both of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed May 21, 1975, Ser. No. 579,423
Int. Cl.² C22F 1/04
U.S. Cl. 148—11.5 A 15 Claims



7. A process of imparting increased ductility and resistance to grain coarsening to an aluminum alloy sheet comprising subjecting said sheet to a step of cold reduction of at least 50% and then to a final partial annealing treatment at a temperature of 500° to 700°F., while limiting the treatment time to a period sufficient only to cause the full recrystallization of 50 to 99% by volume of said alloy and leaving at least 1% by volume of said alloy as strained unrecrystallized grain fragments substantially uniformly dispersed among the said recrystallized grains.

3,966,507

PROCESS FOR MANUFACTURING HOLLOW-CYLINDRICAL ROTORS

Werner Herbert, Markdorf, Germany, assignor to Dornier System GmbH, Germany

Filed Jan. 24, 1975, Ser. No. 543,935
Claims priority, application Germany, Mar. 21, 1974, 2413519
Int. Cl.² C21D 9/08, 9/50
U.S. Cl. 148—12 R 3 Claims

1. A process for manufacturing an axially symmetrical rotor adapted to rotate about the vertical axis thereof and having a length greater than the diameter thereof which comprises rolling a thin, high-strength steel sheet to form a cylinder having a longitudinally-extending joint,

welding said joint by electron beam welding,

solution-treating the blank thus formed,

and bringing the blank to its final dimensions by means of the three-roll press rolling process wherein the blank mounted on a rotating pressure mandrel having a stop is pressed by pressure rollers moving toward the stop while the material of the blank flows counter-currently with respect thereto.

3,966,508

TREATING WASTE DISCHARGE LIQUIDS FROM METAL HARDENING BATHS, PARTICULARLY CONTAINING NITRITE AND NITRATE COMPOUNDS

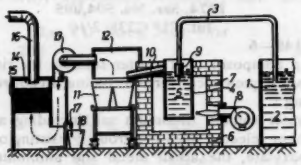
Ekkehard Mohr, Kleinheppacher Weg 10, 7050 Waiblingen, Germany

Filed Aug. 6, 1974, Ser. No. 495,193
Claims priority, application Germany, Aug. 9, 1973, 2340405
Int. Cl.² C21D 1/48
U.S. Cl. 148—15 5 Claims

1. Method of continuously treating waste discharge aqueous liquid from baths of industrial cyanidecontaining hardening or treating salts, by evaporation of liquid and detoxification of the cyanide portions by oxydation comprising

preparing a melt of the salts comprising a nitrate-nitrite mixture at a temperature of about at least 400°C;

introducing the discharge liquid into the melt in controlled amounts insufficient to lower the temperature of the melt in the immediate vicinity of the introduction location to



below evaporation temperature of the water to effect essentially immediate evaporation of the water content of the discharge liquid and to introduce the salts in the discharge liquid into the melt;

permitting the melt to overflow an overflow level;

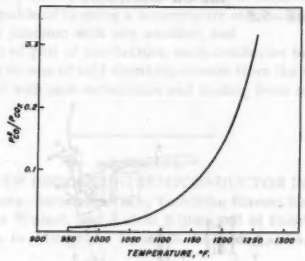
and recovering the overflowing melt.

3,966,509

METHOD FOR REDUCING CARBON DEPOSITS DURING BOX ANNEALING

Harry H. Podgurski, Greensburg, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 22, 1975, Ser. No. 543,198
Int. Cl.² C21D 1/48
U.S. Cl. 148—16 5 Claims



1. In the box annealing of ferrous metal sheet, wherein said sheet is heated in a controlled protective atmosphere to a soak temperature within the range 1000° –1700°F and held at such soak temperature for a time sufficient to effect desired softening thereof,

the improvement for significantly reducing the occurrence of carbon deposits which comprises,

a. during the initial heating period when the temperature of said sheet is being raised; employing a first gaseous atmosphere which is essentially devoid of CO and CO_2, consists essentially of at least 5% H_2, at least 0.2% H_2O, balance N_2, and

b. subsequent to the time the temperature of exposed portions of said sheet reaches a minimum replacement temperature, said minimum replacement temperature being within the range 1000° – 1400°F, adjusting the controlled protective atmosphere to a second atmosphere consisting essentially of 3 – 30% CO_2, 3 – 30% CO, 4 – 20% H_2, 0.5 – 5% H_2O, balance N_2, and maintaining said second atmosphere during the soak.

3,966,510
FERROMAGNETIC POWDER FOR MAGNETIC RECORDING MEDIUM AND METHOD FOR PREPARATION THEREOF

Masashi Aonuma; Yasuo Tamai, and Goro Akashi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 15, 1974, Ser. No. 497,794
Claims priority, application Japan, Aug. 15, 1973, 49-91498
Int. Cl.² H01F 1/02
U.S. Cl. 148—105 19 Claims

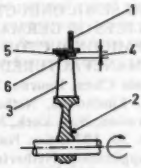
1. A method for the preparation of a ferromagnetic powder for a magnetic recording medium which contains at least one of Fe—B, Co—B, Fe—Co—B, Fe—Ni—B, Co—Ni—B, or Fe—Co—Ni—B with the surface of the ferromagnetic powder having thereon a layer of Cr or a layer mainly consisting of Cr, the method comprising reducing a metal salt capable of forming a ferromagnetic powder containing at least one of Fe, Co, Fe—Co, Fe—Ni, Co—Ni and Fe—Co—Ni in an aqueous solution thereof with one or more borohydride compounds or derivatives thereof, and, after the reducing is initiated, adding an aqueous solution containing Cr ion or a Cr-containing anion to said reaction solution, the method being conducted under the following conditions:

a. the amount of Cr added to the aqueous solution of the metal salt is about 0.001 to 0.5 mol per 1 mol of metal ion in the aqueous solution of the metal salt;
b. under a pressure of about 0.5 to 5 atmospheres;
c. at a temperature of about −10°C. to about 65°C;
d. the pH of the reaction solution being about 12 or less;
e. the metal ion concentration of the aqueous solution ranging from about 0.002 to 2 moles/liter;
f. the concentration of said borohydride compound or derivative thereof reducing agent being in the range of about 0.002 to 10 moles/liter; and
g. the molar ratio of the borohydride compound or derivative thereof reducing agent to the metal ion being in the range of about 0.1 to 5.

3,966,511
PROCESS FOR THE MANUFACTURE OF ANTI-ABRADANT ELEMENTS

Josef Zboril, Fislisbach, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed June 27, 1974, Ser. No. 483,812
Claims priority, application Switzerland, June 29, 1973, 9488/73
Int. Cl.³ C21D 5/00
U.S. Cl. 148—127 6 Claims



1. A method for reducing abrasion between interacting moving parts, which comprises:

fixedly attaching an anti-abradant element of gray cast iron onto the surface of a moving part such that it is positioned between said moving parts;

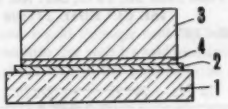
pre-annealing said anti-abradant element attached to said moving part at a temperature of at least 250°C; and

allowing the dimensional proportions of said anti-abradant element to increase upon exposure to oxidation, sulfation, nitration, carbonization, heat annealing, or combinations thereof as said anti-abradant element is abraded, whereby the spacing between said moving parts is maintained relatively constant.

3,966,512
METHOD OF MANUFACTURING TARGETS OF PICKUP TUBES

Yasuhiko Nonaka, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 5, 1974, Ser. No. 503,261
Claims priority, application Japan, Sept. 10, 1973, 48-101162
Int. Cl.² H01L 21/06, 21/203, 27/14
U.S. Cl. 148—174 10 Claims

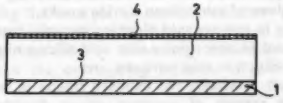


1. A method of manufacturing the target of a pickup tube comprising forming an N-type transmitting conductive film on a substrate, forming an N-type photoconductive film consisting of a group II–VI compound on said N-type light transmitting conductive film by means of a vacuum deposition device comprising a boat for containing said compound and a hollow shielding member, and then applying a P-type amorphous photoconductive film consisting essentially of metallic selenium onto said N-type photoconductive film, the temperature of said substrate being maintained in a range of from 50°C to 250°C when said N-type photoconductive film is formed on said N-type light transmitting conductive film, and the N-type photoconductive film being formed in a thickness of from about 120A to 260A.

3,966,513
METHOD OF GROWING BY EPITAXY FROM THE VAPOR PHASE A MATERIAL ON SUBSTRATE OF A MATERIAL WHICH IS NOT STABLE IN AIR

Jean Philippe Hallais, Paris; Alain Humbert, Plessis Trevise, and Claude Schemali, Paris, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 8, 1974, Ser. No. 440,717
Claims priority, application France, Feb. 13, 1973, 73.05049
Int. Cl.³ H01L 7/36
U.S. Cl. 148—175 8 Claims



1. A method of epitaxially growing a monocrystalline layer of a first material from the vapor phase on an oxide free surface of a substrate of a second material oxidizable in air, said method comprising epitaxially growing a layer of said second material on a support of a monocrystalline material having the desired crystalline structure, reducing the thickness of said support to a value sufficiently less than the thickness of the layer of said second material to enable removal by etching of said support from the layer of said second material, introducing said support and attached layer of said second material into a non-oxidizing atmosphere and then, while in said non-oxidizing atmosphere, subjecting said support and attached layer of said second material to the action of an etch for a time sufficient to cause complete removal of said support but insufficient to cause complete etching of the layer of said

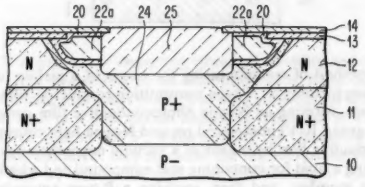
second material thereby leaving exposed the surface of the layer of said second material previously attached to said support and growing, by epitaxial deposition from the vapor phase, a monocrystalline layer of said first material on the surface of said second material exposed by etching.

3,966,514

METHOD FOR FORMING DIELECTRIC ISOLATION COMBINING DIELECTRIC DEPOSITION AND THERMAL OXIDATION

Bal-Cwo Feng, Wappingers Falls, and George Cheng-Cwo Feng, Poughkeepsie, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 592,014
Int. Cl.² H01L *21/308*
U.S. Cl. 148—187 **6 Claims**



1. In the fabrication of integrated circuits, a method for forming dielectrically isolated regions in a silicon substrate comprising:

forming a layer of silicon dioxide on a surface of the substrate,

forming a masking layer of silicon nitride having a plurality of openings on said silicon dioxide layer,

etching a plurality of openings through the masked silicon dioxide layer in registration with the silicon nitride mask openings, said silicon dioxide layer openings having greater lateral dimensions than the silicon nitride openings and, thus, undercut the silicon nitride at the periphery of said mask openings,

etching a plurality of recesses in the silicon substrate respectively in registration with the openings through the silicon dioxide and silicon nitride layers,

depositing a layer of a material capable of blocking the oxidation of silicon and having greater etchability than silicon nitride in said recesses covering said undercut portions of said silicon nitride masks,

etching to remove said blocking material from the portions of said recesses not under said silicon nitride to expose the silicon in said portions, and

thermally oxidizing the exposed silicon in said recesses to form regions of recessed silicon dioxide substantially coplanar with the unrecessed portions of the silicon substrate.

3,966,515

METHOD FOR MANUFACTURING HIGH VOLTAGE FIELD-EFFECT TRANSISTORS

Samuel Josepheus Guthrie, Portland, Oreg., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed May 17, 1974, Ser. No. 470,803
Int. Cl.² H01L *7/34*
U.S. Cl. 148—188 **1 Claim**

1. The method of manufacturing high voltage field-effect transistors, comprising the steps of:

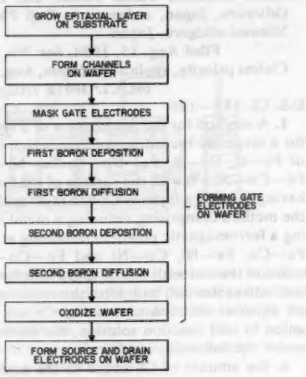
growing an epitaxial layer of a desired conductivity upon a substrate of the opposite conductivity,

forming channels of desired conductivity on the wafer,

forming gate regions on the wafer by the steps of:

masking the wafer to expose only the gate region areas,

forming a first boron deposition on the wafer,



diffusing the first boron deposition into the wafer,

forming a second boron deposition on the wafer,

diffusing the second boron deposition into the wafer, and

oxidizing the wafer, and

forming the source and drain electrodes on the wafer.

3,966,516

SLURRY EXPLOSIVE COMPOSITION CONTAINING A NITROPARAFFIN AND AN AMIDE

Hiroshi Sakai; Fumio Takeuchi, and Tsutomu Hanake, all of Aichi, Japan, assignors to Nippon Oils and Fats Company Limited, Tokyo, Japan

Filed June 18, 1975, Ser. No. 588,052
Claims priority, application Japan, June 25, 1974, 49-72599
Int. Cl.² C06B *31/30*
U.S. Cl. 149—60 **9 Claims**

1. A slurry explosive composition comprising an inorganic oxidizing acid salt, water, a combustible material, a thickener, a nitroparaffin and an amide.

3,966,517

MANUFACTURING SEMICONDUCTOR DEVICES IN WHICH SILICON SLICES OR GERMANIUM SLICES ARE ETCHED AND SEMICONDUCTOR DEVICES THUS MANUFACTURED

Hendrik Armand Denis Claes, Deurne, Belgium, and Wolter Geppienus Gelling, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 30, 1974, Ser. No. 510,492
Claims priority, application Netherlands, Oct. 3, 1973, 7313572
Int. Cl.² H01L *21/306*
U.S. Cl. 156—7 **12 Claims**

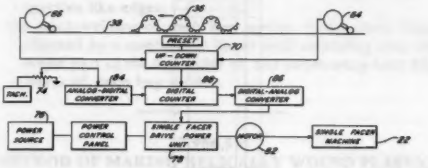
1. A method of etching a semiconductor device in which at least one silicon slice or germanium slice is secured by one side to a sodium containing glass support comprising exposing said device to the action of an etching bath containing hydrofluoric acid, at least one oxidizing agent and an amount of silicon dissolved therein that is at least equivalent to the amount of sodium dissolved from the glass support upon initial contact of said etching bath upon said glass support.

7. A method as claimed in claim 1, characterized in that the glass support has a coefficient of expansion which differs at most 25% from that of the material of the slice.

3,966,518
PAPERBOARD CORRUGATOR

James T. Ferara, and William A. Massey, both of Gibbsboro, N.J., assignors to Molins Machine Comapny, Inc., Camden, N.J.

Filed Dec. 26, 1973, Ser. No. 428,296
Int. Cl.² G05G 15/00
U.S. Cl. 156—64 5 Claims



1. A method of producing corrugated paperboard wherein single face paperboard is fed from a single facer machine to a bridge and withdrawn from the bridge by a double facer machine comprising the steps of generating a quantity signal indicative of the rates at which single face paperboard is fed to and removed from the bridge, automatically generating a control signal indicative of a desired time a unit length of the single face paperboard should remain on the bridge by modifying a signal indicative of the speed of the double facer machine, automatically comparing said signals and generating an output discrepancy signal, and using the output discrepancy signal to automatically control the speed of the single facer machine so that a unit length of single face paperboard remains on the bridge a preselected time.

5. In a corrugator wherein single faced paperboard from a single facer machine is fed to a bridge and withdrawn from the bridge by a double facer machine comprising means coupled to said single facer machine for controlling the speed thereof so that a unit length of single faced paperboard remains on the bridge for a predetermined time regardless of variations in the speed of the double facer machine, said means including a first device for detecting the amount of single facer paperboard fed to the bridge and for generating a signal indicative thereof, a second device for detecting the amount of single faced paperboard removed from the bridge and for generating a signal indicative thereof, a comparator means coupled to said devices for comparing said signals and generating a quantity signal, means for generating a control signal indicative of a desired amount of time the single faced paperboard should remain on the bridge, means for automatically comparing said quantity signal with said control signal and for generating an output signal, said last mentioned means being connected to the drive unit of a single facer machine to automatically vary the speed of the single facer machine as a function of said output signal.

3,966,519
METHOD OF BONDING FIBROUS WEBS

Kenneth J. Mitchell, Neenah, and Kurt W. Ostermeier, Harrison, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

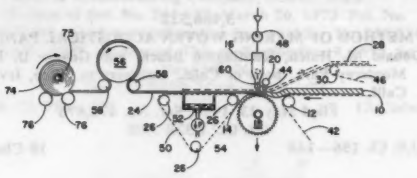
Filed Dec. 27, 1974, Ser. No. 536,728
Int. Cl.² B32B 31/22
U.S. Cl. 156—73.1 14 Claims

1. Method of bonding a base fibrous web comprising the steps of,

providing a patterned bonding nip including a hammer adapted to vibrate at high frequencies and an anvil,

applying a liquid to the web in an amount sufficient to insure the presence of uncombined liquid at said nip,

vibrating said hammer at high frequencies of up to 400,000 cps with an amplitude in the range of from about 1 to 30 mils, and

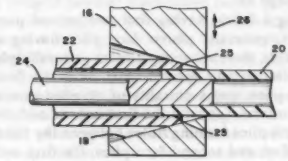


passing said web and liquid through said nip to cause the liquid to be driven into the web by said vibrations and to knot the fibers of the web in the pattern bond areas.

3,966,520
METHOD OF ULTRASONICALLY WELDING A CIRCUMFERENTIAL TELESCOPING JOINT

Eberhardt G. Fallenbeck, Georgetown, and Wayne N. Upright, West Newbury, both of Mass., assignors to Branson Ultrasonics Corporation, New Canaan, Conn.

Filed July 14, 1975, Ser. No. 595,773
Int. Cl.² B32B 31/20, 31/22
U.S. Cl. 156—73.1 13 Claims



1. The method of welding two thermoplastic workpieces, an outer workpiece and an inner workpiece, along telescopingly overlapping surfaces comprising the steps of:

disposing the workpieces to be joined in telescopically overlapping surface relation with one another on a mandrel;

applying ultrasonic vibratory energy to the overlapping surfaces in a generally radial direction relative to the axis of the mandrel, and

providing a compressive force in a substantially radial direction along the circumference of the outer workpiece while rotating the workpieces and said vibratory energy is applied for urging the workpieces into forced contact and causing responsive to said energy and force a butt joint between the overlapping surfaces of said workpieces.

3,966,521
POLYURETHANE FOAM COMPOSITE

John T. Patton, Jr., Wyandotte; Louis C. Pizzini, Trenton; John G. Demou, Lincoln Park, all of Mich., and Gerhard G. Ramlow, East Windsor, N.J., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 513,639, Oct. 10, 1974, Pat. No. 3,931,450. This application June 16, 1975, Ser. No. 587,476
Int. Cl.² B32B 5/20
U.S. Cl. 156—78 8 Claims

1. In a process for the production of a laminated composite which comprises heat sealing a substrate to a polyurethane foam prepared by the reaction of an organic polyisocyanate with a polyol in the presence of a blowing agent the improvement which comprises employing as the polyol a graft polyol prepared by the in situ polymerization in the presence of a free

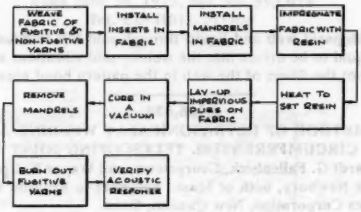
radical catalyst of an ethylenically unsaturated monomer or mixture of monomers in a polyol.

3,966,522

METHOD OF MAKING WOVEN ACOUSTICAL PANEL

Donald M. Hatch, Huntington Beach, and George D. Lee, Monterey Park, both of Calif., assignors to Hitco, Irvine, Calif.

Filed May 23, 1974, Ser. No. 472,670
Int. Cl.² B32B *5/08*
U.S. Cl. 156—148 **18 Claims**


WEAVE FABRIC OF FUGITIVE & NON-FUGITIVE YARNS
INSTALL INSERTS IN FABRIC
INSTALL MANDRELS IN FABRIC
IMPREGNATE FABRIC WITH RESIN
REMOVE MANDRELS
CURE IN A VACUUM
LAY-UP IMPERVIOUS PLIES ON FABRIC
HEAT TO SET RESIN
BURN OUT FUGITIVE YARNS
VERIFY ACOUSTIC RESPONSE

10. A method of making a woven acoustical panel comprising the steps of:

weaving a fabric having first and second parallel, spaced-apart, generally planar face plies having a plurality of pockets therebetween, a third generally planar face ply parallel to and spaced-apart from the first and second face plies, and a plurality of rib plies extending between and interwoven with the first, second and third face plies, the rib plies forming flutes between the third face ply and the first and second face plies, the first and second face plies being comprised of yarns, each of which is comprised of both fugitive material and non-fugitive material, the yarns being interwoven with each other;

providing a plurality of generally planar acoustical elements having a controlled porosity;

inserting the acoustical elements into the pockets between the first and second face plies;

inserting a plurality of mandrels into the flutes;

inpregnating the fabric with a resin;

curing the resin impregnated fabric; and

heating the fabric to a temperature sufficient to burn out the fugitive material to the exclusion of the non-fugitive material and thereby form apertures of predetermined size in the first and second face plies, the apertures exposing the acoustical elements to the outside of the panel and to the flutes.

3,966,523

METHOD OF MAKING FILAMENT REINFORCED COMPOSITE RINGS FROM PLURAL FLAT FILAMENTARY SPIRAL LAYERS

Karl Severin Jakobsen, Somers, and David Benjamin McLaughlin, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

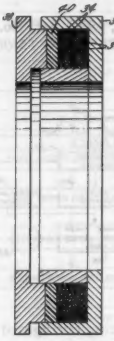
Filed Aug. 11, 1975, Ser. No. 604,300
Int. Cl.² B29D *3/02;* **B29G** *5/00*
U.S. Cl. 156—169 **10 Claims**

1. The method of making a composite ring having a plurality of undirectional filaments embedded in a polymer matrix comprising:

winding a filament into a solvated curable polymer matrix containing curing agents to form a monolayer sheet comprising a filamentary flat spiral;

desolvating the polymer matrix of the monolayer sheet to hold the filament in position in the sheet;

stacking a plurality of the monolayer sheeets in adjacent relationship in an annular mold cavity; and



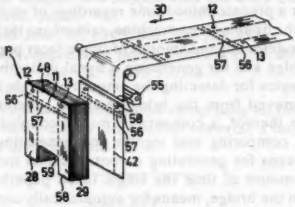
curing the polymer matrix in the stacked monolayer sheets under pressure in said mold cavity to form a unitary composite ring.

3,966,524

METHOD AND APPARATUS FOR MANUFACTURE OF PAD-STACKED BAGS

Hans Lehmacher, 5216 Niederkassel-Mondorf, Hummerich, Germany

Filed Aug. 17, 1972, Ser. No. 282,193
Claims priority, application Germany, Aug. 17, 1971, 2141045; June 19, 1972, 2229728; July 7, 1972, 2233408; July 26, 1972, 2236523
Int. Cl.² B32B *31/00*
U.S. Cl. 156—182 **40 Claims**



1. A method for manufacture, from thermoplastic synthetic plastic film, of bags such as carrying bags or the like packaging stacked and connected with one another through welding into a tear-off type pad, comprising the steps of:

providing a flattened film tube as a longitudinally advanced, continuous web comprising two layers of said film; feeding said web longitudinally downwardly vertically to a welding device acting in a horizontal plane;

severing from said web sections corresponding to respective bags; stacking the severed sections successively into a pad stack; and

stack welding each section to the preceding section as it is added to the stack

with the sections being welded at, or in the region of, respective like edges;

the stacking and welding of the bag sections to the stack being carried out at said device with a substantially vertical disposition of the bag sections.

38. A method for manufacture, from thermoplastic synthetic plastic film, of bags such as carrying bags or the like packaging stacked and connected with one another through welding into a tear-off type pad, comprising the steps of:

providing a flattened film tube as a longitudinally advanced, continuous web comprising two layers of said film;
feeding said web longitudinally to a welding device;
severing, from said web, sections corresponding to respective bags;
stacking the severed sections successively into a pad stack; and
stack-welding each section to the preceding section as it is added to the stack
with the sections being welded at, or in the region of, respective like edges,
the stack-welding of each bag section to the stack being effected by a continuous linear weld extending over the major part of the full width of, and penetrating both film layers of, each bag section.

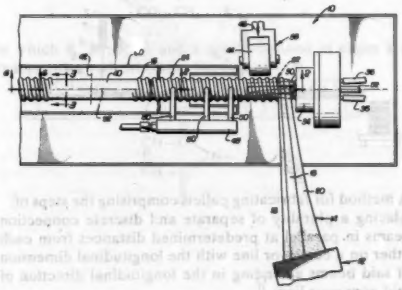
3,966,525
METHOD OF MAKING HELICALLY WOUND PLASTIC TUBING

William L. Steward, Costa Mesa, Calif., assignor to Steward Plastics, Inc., Santa Ana, Calif.

Division of Ser. No. 469,234, May 13, 1974, Pat. No. 3,910,808, which is a continuation of Ser. No. 284,944, Aug. 30, 1972, abandoned. This application Apr. 28, 1975, Ser. No. 572,389

Int. Cl.² B65H *81/00*

U.S. Cl. 156—195 **1 Claim**



1. A method of making helically externally ribbed plastic tubings having externally smooth, thickened end fittings, including the steps of:
a. continuously extruding a plastic strip with a longitudinal rib;
b. continuously helically winding said strip into a tube, at a winding location on the axis of said tube, with said rib externally of said tube and with one edge of each convolution of said strip overlapping an edge of a preceding convolution;
c. periodically flattening the external rib, at a flattening location adjacent but spaced downstream from said winding location in the direction of the axis of said tube, to provide said tube with longitudinally spaced, externally smooth portions of increased wall thickness compared to the interrib portions of said tube; and
d. thereafter periodically cutting said tube transversely, at a cutting location spaced downstream from said flattening location in the direction of the axis of said tube, intermediate the ends of said externally smooth portions to provide externally helically ribbed tubings having externally smooth, thickened end fittings.

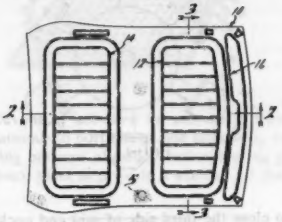
3,966,526
PROCESS FOR MAKING RESILIENT LAMINAR PANEL

Ralph G. Doerfling, Walled Lake, Mich., assignor to Detroit Gasket & Manufacturing Company, Detroit, Mich.

Division of Ser. No. 344,629, March 26, 1973, Pat. No. 3,867,240, which is a continuation-in-part of Ser. No. 255,524, May 22, 1972, abandoned. This application Dec. 9, 1974, Ser. No. 530,806

Int. Cl.² B65D *25/06*; E04B *1/74*

U.S. Cl. 156—224 **12 Claims**



1. A method for making a resilient laminar panel of a preselected shape-retaining contour which comprises the steps of forming a layer of substantially thermoplastic rigid foam having cover sheets bonded to the face surfaces thereof providing therewith an integral laminar foam-cored panel, piercing said foam-cored panel to impart a plurality of perforations extending therethrough from one face to the opposite face of said panel and performed in a manner to deform and laterally displace and locally densify said foam in a region surrounding each perforation without incurring any appreciable removal of material and without significantly reducing the thickness of said panel, said piercing step performed to distribute said perforations at spaced intervals over substantially the entire surface area of said panel, coating the exterior surfaces of said panel including the interior surfaces defining said perforations with a sealing material forming a substantially moisture-resistant barrier thereover, heating the sealed said panel to an elevated temperature for a period of time sufficient to effect a softening thereof, deforming the heat softened said panel to impart a preselected contour thereto, cooling the deformed said panel to a temperature at which a rigidification thereof occurs of a magnitude sufficient to retain at least a portion of the preselected contour therein, and applying and securing a pervious decorative ply to one said face surface of said panel forming a decorative laminar panel.

3,966,527
MANUFACTURE OF ARTICLES OF A SUBSTANTIALLY SACK-LIKE OR TUBULAR STRUCTURE

Eugene Gros, 9 Harman Drive, London NW2, England

Division of Ser. No. 358,953, May 10, 1973, abandoned. This application May 6, 1975, Ser. No. 575,075

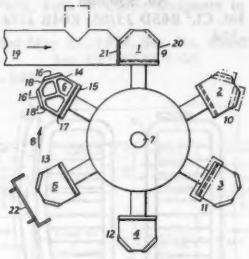
Claims priority, application United Kingdom, June 4, 1970, 26997/70

Int. Cl.² B32B *31/00*

U.S. Cl. 156—250 **9 Claims**

1. A method of producing a generally three-sided tubular article from a continuous length or web of sheet material, which comprises the steps of feeding along a path having at least a linear terminal portion two continuous web sections, one superposed upon the other, which are joined along a common edge to provide when viewed in transverse cross-section, a generally U-shaped web configuration having a transverse dimension generally corresponding to the depth dimension of said tubular article sealing together the leading edges of said web sections along a line extending generally transversely of the web length to form the leading end into a two-sided pocket, advancing a generally flattened supporting form

in a plane generally coincident with the linear web path portion along an angular path intersecting with said terminal web path portion to introduce said flattened form into said semipocket with the leading end of said form engaging said sealed web end, sealing together said two web sections along a transverse strip region immediately proximate the trailing end of



said form to close the third side of said end pocket with the form disposed therein, separating the thus-formed pocket from the web sections by severing through said sealed strip to concurrently form a further two-sided semipocket, transfering the separated article containing the supporting form from said terminal path portion, and repeating said advancing, sealing, separating and transfering steps with further supporting forms.

3,966,528

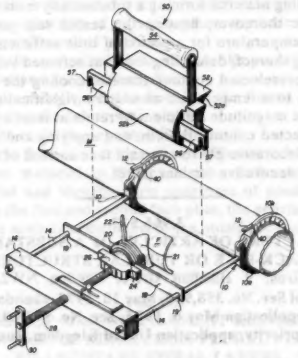
APPARATUS AND METHOD FOR JOINING A BRANCHING FITTING TO A PIPE

Joe William Christie, Box 386, Frisco, Tex. 75034

Filed Aug. 14, 1974, Ser. No. 497,396

Int. Cl.² B23Q *3/18*; B25B *1/20*; B32B *31/20*

U.S. Cl. 156—293 **10 Claims**



1. An apparatus for attaching a fitting to a side wall of a pipe with the axis of the fitting being substantially perpendicular to the axis of the pipe, comprising:

at least two cold rings for attachment to the pipe;

removable inserts mounted within said cold rings for accommodating varying sizes of pipe;

a guide rod attached to each of said cold rings and extending outwardly therefrom perpendicular to the axis of the pipe;

a base plate slidably mounted on said guide rods for movement relative to the pipe;

a receiver member fixed to said base plate and adapted to receive the fitting to be joined to the pipe;

removable inserts mounted within said receiver member for accommodating varying sizes of fittings to be joined to the pipe;

a top bar fixedly attached between said guide rods;

a threaded shaft with one end attached to said receiver member and with the second end passing through said top bar;

an engaging member in said top bar having a semibore threaded therein with threads which mate with those of said threaded shaft such that selective engagement between said shaft and said engaging member may be had by depressing the engaging member until it is engaged with the threads on said shaft whereby said shaft may be translated through said top bar by turning said shaft; and

a removable heating unit slidably positioned on said guide rods having one face substantially conforming to the shape of the side wall of the pipe and with a second face substantially conforming to the shape of the fitting to be joined to the pipe so that said fitting and side wall of the pipe may be heated by said heating unit prior to joining.

3,966,529

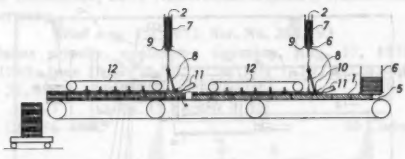
METHOD OF MAKING A PALLET

Shigeharu Kuroda, 5-1-13 Tomigaoka, Nara, 631, Japan

Continuation-in-part of Ser. No. 343,024, March 20, 1973, abandoned. This application Feb. 20, 1975, Ser. No. 551,508

Int. Cl.² B32B *31/20, 31/12, 31/26*; B65D *19/00*

U.S. Cl. 156—300 **7 Claims**



1. A method for fabricating pallets comprising the steps of:

a. placing a plurality of separate and discrete connection beams in parallel at predetermined distances from each other on a conveyor line with the longitudinal dimension of said beams extending in the longitudinal direction of said conveyor line;

b. intermittently moving said conveyor line and said connection beams longitudinally to predetermined positions and stopping said conveyor line and connection beams;

c. intermittently supplying a plurality of lateral plates to said predetermined positions at spaced intervals on one side of the thus intermittently moved beams with said plates extending transversely to the longitudinal dimension of said beams and at a predetermined angle to the surface of said beams, and stopping the movement of said plates before said plates are in full contact with said beams;

d. applying a means for providing an adhesive on the contacting surfaces of at least one of said plates and beams while said beams and plates are stopped;

e. thereafter continuing the intermittent movement of said beams and plates to place said beams and said plates in parallel, immediately thereafter pressing said plates against said beams by a press means, and moving said beams and plates in full contact through said press means under pressure for a desired time to form a secure bond therebetween; and

f. releasing the thus bonded beams and plates from said press means, turning the thus released bonded beams and plates over, and repeating steps (b)–(e) to thereby bond further plates at predetermined intervals to the opposite side of said beams.

3,966,530
SURFACE TREATMENT OF POLYMERS

Ernest Cutts, and Geoffrey Thomas Knight, both of London, England, assignors to The Malaysian Rubber Producers' Research Association, England

Filed Oct. 29, 1974, Ser. No. 518,938
Int. Cl.² C09J *5/02*
U.S. Cl. 156—308 **10 Claims**

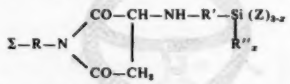
10. A method of adhering a surface of a non-polar unsaturated elastomer to a substrate comprising treating the surface of the elastomer by applying thereto a 4-substituted-1,2,4-triazoline-3,5-dione, applying an adhesive to the treated elastomer surface, the substrate or both treated elastomer surface and substrate and adhering the elastomer surface and substrate together.

3,966,531
COMPOSITIONS CONTAINING SILANES POSSESSING IMIDE GROUPS

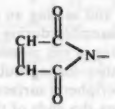
Michel Bargain, Lyon, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Feb. 3, 1975, Ser. No. 546,447
Claims priority, application France, Feb. 5, 1974, 74.03799
Int. Cl.² C09J *1/00, 5/00*
U.S. Cl. 156—329 **11 Claims**

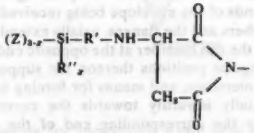
5. A composition based on imide group-containing organosilicon compound which comprises a compound of the formula:



in which R, R', R''Z and x are as defined in claim **1** and Σ represents a radical of the formula:



or



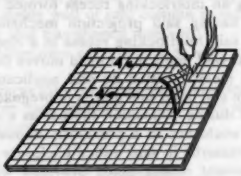
10. In a process for adhering an organopolysiloxane composition which can be vulcanised at ambient temperature in the presence of water in the liquid or vapour state to a substrate which comprises placing an adhesive between the composition and the substrate, the improvement wherein the adhesive is a composition as defined in claim **5.**

3,966,532
METHOD OF MAKING WATER COLOR PICTURES READY FOR FRAMING

Ruth P. Harasta, 1434 Oakdale Road, Johnson City, N.Y. 13790

Continuation of Ser. No. 352,605, April 19, 1973, abandoned. This application Dec. 5, 1974, Ser. No. 529,960
Int. Cl.² B32B *7/06, 31/18;* **B29D** *3/00;* **B44D** *1/32*
U.S. Cl. 156—344 **6 Claims**

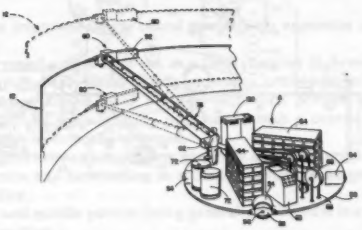
1. The method of making a work of art comprising the steps of cutting through an adhesive-bearing plastic sheet which is adhesively removably secured to a back sheet to circumscribe an area of said plastic sheet, removing said circumscribed area of said plastic sheet together with the adhesive carried by said area of said plastic sheet to provide an open sight area substantially devoid of adhesive on said back sheet, applying coloring materials to portions of said sight area, and stripping the remaining portions of said adhesive-bearing plastic sheet from said back sheet to provide a work of art then ready for framing.



3,966,533
ON-SITE WALL STRUCTURE FORMATION

William Brandt Goldsworthy, Palos Verdes, and Ethridge E. Hardesty, Pine Valley, both of Calif., assignors to Goldsworthy Engineering, Inc., Torrance, Calif.

Continuation-in-part of Ser. No. 352,413, April 19, 1973, abandoned. This application Sept. 19, 1973, Ser. No. 398,755
Int. Cl.² B32B *19/02*
U.S. Cl. 156—380 **26 Claims**



1. Apparatus for generating a reinforced plastic composite walled enclosure formed of successive turns of spirally wound reinforcing material; said apparatus comprising:

a. a supporting member rotatable through a cylindrical path,

b. an application head carried by said supporting member and being movable in a cylindrical path of peripheral length substantially equivalent to the peripheral length of the walled enclosure to be formed,

c. delivery means including a canister which contains a substantially fully cured amount of a matrix impregnated fiber containing reinforcing material having a cross-sectional shape substantially equivalent to the shape of a turn in the walled enclosure for delivery to said application head,

d. application means operatively associated with said application head for receiving said matrix impregnated reinforcing material to deposit said matrix impregnated reinforcing material as a turn on a previously deposited turn of the spirally wound reinforcing material,

e. said application means comprising a draw-die which essentially conforms to the size and shape of a new turn of the impregnated reinforcing material and which die is essentially closed and open on one side thereof, said application means being located so that a previously

deposited turn of said walled enclosure substantially closes said draw-die in such size and shape to receive and deposit said impregnated reinforcing material,

f. one of said last previously deposited turns and said new turn having an interlockable projection extending therefrom toward the other of said turns and said other of the turns having an interlocking recess formed therein and capable of having said projection mechanically interlocked into said interlocking recess in a zipper type arrangement as said application head moves therealong,

g. securement means carried by said application head to rigidly secure and bond said matrix impregnated reinforcing material during deposition thereof as a new turn of said walled enclosure to a previously deposited turn of reinforcing material in said walled enclosure,

h. said securement means being provided with bonding means to chemically bond the projection of one of said turns into the interlocking recess of the other of said turns,

i. and means on said application head to retentively hold said new turn on said last previously deposited turn of reinforcing material during a portion of the chemically bonding of the projection and the interlocking recess during movement of the application head therealong.

3,966,534

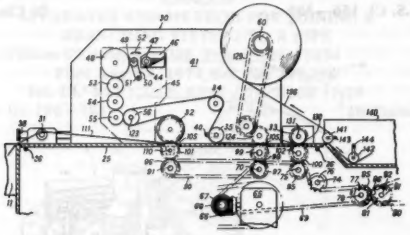
LETTERPRESS PRINTING MACHINE

Keith Mason Oddy, 58 Baldwin Road, Kidderminster, England

Filed Jan. 30, 1974, Ser. No. 437,947

Int. Cl.² B32B *31/18*

U.S. Cl. 156—384 **10 Claims**



1. A rotary letterpress label making machine for making labels from a laminated strip formed of a paper web and a cover web in superposed relation with the side of the paper web facing the cover web coated with adhesive while the other side of the paper web is uncoated, said machine comprising:

a. a frame through which the strip moves from a supply reel;

b. rotary printing means in the frame operable for printing label matter in discrete label regions on the uncoated side of the paper web;

c. die cutting means in the frame operable for cutting through the paper web only and along lines which form closed paths about the label regions to separate the paper web into a continuous waste matrix and discrete label elements;

d. means driving said printing means and die cutting means in synchronism;

e. a support member engaging the cover web side of the strip along a region extending transversely of the strip downstream from the die cutting means and forming a deviating region wherein the cover web and the printed labels thereon is separated from the waste matrix of the paper web;

f. a first guide means engaging the uncoated side of said paper web near said region and guiding the waste matrix in a first direction away from said deviating region;

g. a second guide means spaced downstream from said first guide means engaging the label side of said cover web and guiding the cover web with the labels thereon away from said deviating region in a second direction, said first and second directions diverging in respectively opposite senses from the path of the strip from said die cutting means to said deviating region; and

h. first and second wind-up means in the frame engaging the matrix and the cover web respectively and driven for reeling up the matrix and the cover web simultaneously while holding the matrix and cover web taut between the die cutting means and the wind-up means, said second guide means being spaced from said deviating region in a direction perpendicular to the plane of said strip to prevent the said first guide means for engaging the said label elements and thereby damaging the printing thereon.

3,966,535

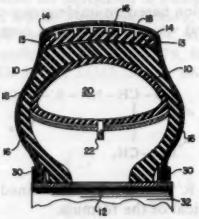
ENVELOPE SEALING APPARATUS FOR COLD PROCESS TIRE RETREADING

Antonio Dabura Abularach, P.O. Box 560, Cochabamba, Bolivia

Filed Jan. 15, 1975, Ser. No. 541,136

Int. Cl.² B29H *5/04, 17/36*

U.S. Cl. 156—394 **3 Claims**



1. Apparatus for holding and sealing an envelope about a tire casing and tread strip assembly during a cold vulcanization operation, which includes: a rim member for supporting a tire casing said rim member having outwardly extending radial flanges on the outer peripheral surface thereof at opposite ends thereof for receiving the ends of the envelope adjacent to the respective outer surfaces of the flanges; an annular pressure member mounted on each end of the rim member adjacent to the outer surface of a corresponding one of the flanges with the ends of the envelope being received between the pressure members and the flanges; axially extending guide means formed on the rim member at the opposite ends thereof and at spaced angular positions thereon for supporting the annular pressure members; and means for forcing each pressure member axially inwardly towards the corresponding flange to squeeze the corresponding end of the envelope against the outer surface of the corresponding flange so as to provide a securing means for the envelope.

3,966,536

TIRE BUILDING MACHINERY

Otto Schmitt, Niedergrundau, Germany, assignor to Dunlop Limited, London, England

Filed May 7, 1974, Ser. No. 467,814

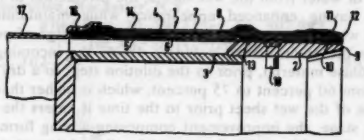
Claims priority, application Germany, May 15, 1973, 2324570

Int. Cl.² B29H *17/12*

U.S. Cl. 156—401 **18 Claims**

1. A folding device comprising a folding bag which is inflatable from a flattened, cylindrical shape to a toroidal shape, and is supported at least partially on a cylindrical support, a first end of the bag lying substantially flush with one end of the support, the bag being secured to the support at a point adjacent said end at a point intermediate the ends of the bag, the bag comprising an endless flexible-walled tube being covered

on its inner periphery by a first reinforcing layer and on its outer periphery by a second reinforcing layer, each of said reinforcing layers comprising two layers of oppositely disposed bias-cut cord plies, the bias angle of the cords of the plies of the first reinforcing layer being greater than that of the second reinforcing layer and a restoring device secured to the end of the bag remote from said first end.

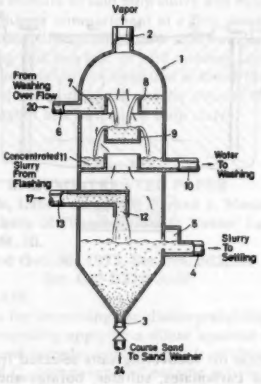


3,966,537

DEVICE FOR WASTE HEAT RECOVERY AND SAND REMOVAL IN THE BAYER PROCESS

Chosei Sato; Yasutoku Yamada, and Yoshiyuki Takenaka, all of Yokohama, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 228,624, Feb. 23, 1972, Pat. No. 3,869,537. This application Oct. 3, 1974, Ser. No. 511,724
Claims priority, application Japan, Feb. 24, 1971, 46-8667
Int. Cl.² B01D *1/28, 1/14, 35/18*
U.S. Cl. 159—2 R **2 Claims**



1. A device for recovering waste heat and for desanding slurry prepared in production of alumina by treating bauxite containing monohydrated alumina with an aqueous solution of caustic soda at high temperature and high pressure by the Bayer process, said device comprising in combination,

A. a column, the bottom of which has a funnel shape;

B. a discharge pipe for vapor, disclosed at the top of said column;

C. a feed pipe for said slurry, disposed at a lower portion of said column;

D. a discharge pipe for overflow slurry having been deprived of coarse sand particles, said discharge pipe disposed below the level of said feed pipe and having an overflow decanting space;

E. a feed pipe for overflow liquid from a red mud thickener of the Bayer process disposed at an upper portion of said column;

F. a substantially annular overflow barrier disposed within said column at the same level as said feed pipe for the overflow liquid from the red mud thickener;

G. an overflow duct bounded by the inside wall of said column and said overflow barrier in communication with said feed pipe for the overflow liquid from the red mud thickener;

H. a tray-shaped reservoir disposed below said overflow duct to receive liquid overflowing said barrier;

I. an annular duct formed below said tray-shaped reservoir on the inside wall of said column to receive liquid overflowing said tray-shaped reservoir;

J. a discharge pipe communicating with said annular duct; and

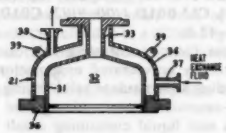
K. a discharge pipe for separated coarse sand particles, said discharge pipe disposed at the funnel shaped bottom of said column.

3,966,538

FALLING STRAND DEVOLATILIZATION APPARATUS

Carl G. Hagberg, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 322,261, Jan. 9, 1973, Pat. No. 3,928,300. This application Dec. 13, 1974, Ser. No. 532,339
Int. Cl.² B01D *1/28, 1/06, 1/00, 1/10*
U.S. Cl. 159—2 R **4 Claims**



1. An improved falling strand devolatilizer apparatus comprising:

A. a vessel adapted for use as a flash chamber in devolatilization, said vessel having an upper portion, a middle portion and a lower portion, each such portion being generally symmetrically positioned about a central axis which is vertically oriented,

1. said lower portion being generally conical in cross-section and terminating in a fluid material discharge orifice,

2. said middle portion being generally cylindrical in cross-section,

3. said upper portion having a relatively large axially located material input orifice and further having a relatively small, circumferentially located, gaseous material exhaust port means,

4. said vessel having its walls generally circumscribed by heat exchange means adapted to heat said walls to a predetermined temperature during operation of said apparatus,

B. a shell and tube heat exchanger means having vertical tube members is spaced, parallel relationship to one another all enclosed and mounted generally within a shell member,

1. said shell member having heat exchange fluid input and output ports therein,

2. each of said tube members having a length of from about 2 to 8 feet, an average inside diameter which is generally constant with respect to said length thereof and which ranges from about 0.5 to 1.5 inches, and a ratio of said length to said diameter ranging from about 30 to 80,

3. said shell and tube heat exchanger means being mounted in gas-tight relationship generally transversely across said material input orifice of said vessel with said tube members generally parallel to said central axis, said shell and tube heat exchanger extending down into said upper and middle portions of said vessel defining

an annular manifold zone with said middle zone of said vessel to collect and direct devolatilized vapors out of said exhaust port,.

C. bonnet means for said heat shell and tube heat exchanger means mounted over the exterior, upper end portions of said tube members and adapted to distribute said material as an input process fluid uniformly over said upper end portions from a material input port means coaxially located in a top section of said bonnet,

D. first pump means with associated conduit means functionally interconnected with said material input port means of said bonnet and adapted to supply said input material as heated, viscous material at a predetermined pressure into said bonnet, and

E. second pump means with associated conduit means functionally interconnected with said gaseous material exhaust port means in said vessel and adapted to evacuate and maintain the interior of said vessel at a predetermined low pressure.

3,966,539

PROCESS FOR EXTRACTING DISSOLVED SALTS FROM WATER

Carl W. Garbe, San Carlos, Calif., assignor to Dames & Moore, San Francisco, Calif.

Filed Feb. 22, 1974, Ser. No. 444,640

Int. Cl.[2] B01D *1/00, 9/02;* C01D *3/00*

U.S. Cl. 159—47 R **10 Claims**

1. A process for concentrating salt dissolved in a salt-saturated water by accelerated evaporation comprising the steps of providing a particulate solid having a density greater than the salt-saturated water; mixing said particulate solid particles with said liquid containing a salt to form a slurry having a percentage moisture content in the range of up to 300%; periodically agitating said slurry at at least the air-slurry interface to prevent the formation of any visible clear liquid layer over the solid particles of said slurry; after said agitating step, settling said solid particles from the surface of said slurry; and, decanting the surface of said slurry to remove liquid having dissolved salt concentrated therein.

3,966,540

MANUFACTURE OF FIBERBOARD ACCORDING TO THE WET METHOD WITH CLOSED BACKWATER SYSTEM

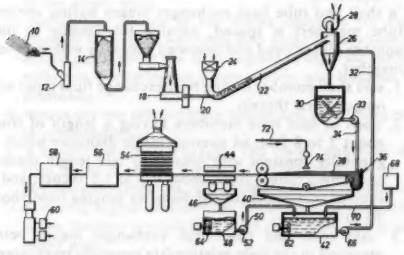
Stig Daniel Selander, Stockholm, Sweden; Bernard Marechal, Casteljaloux, and Corrado D'Andrea, Arpajon, both of France, assignors to Isorel S.A., Puteaux, France and Stig Daniel Selander, Stockholm, Sweden

Filed Sept. 10, 1974, Ser. No. 504,739

Claims priority, application Sweden, Sept. 14, 1973, 7312580

Int. Cl.[2] D21C *3/00;* D21F *1/66*

U.S. Cl. 162—13 **4 Claims**



1. In the method of manufacturing wood fibreboard according to the wet system with closed white water system including defibrating lignocellulose material, diluting the defibrated material in water serving as the transporting medium, forming wet sheets from the diluted pulp, mechanically separating white water obtained from the formation of wet sheets and recirculating it to the dilution stage and final drying by evaporation of water from the wet sheets, the production of fibreboard having enhanced appearance while maintaining a closed white water system with reduced discharge of pollutants to the environment including drying the incoming lignocelloluse material, prior to the dilution step, to a dry content from 60 percent to 75 percent, which is higher than the dryness of the wet sheet prior to the time it enters the final drying stage, the improvement comprising adding formaldehyde to the white water, homogenizing the white water containing said formaldehyde to a degree such that occurring precipitations are atomized prior to using it for dilution of incoming fibre material.

3,966,541

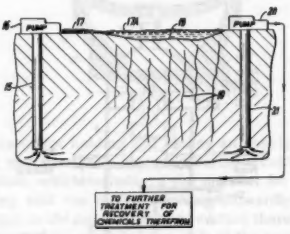
CONCENTRATION OF UNDERGROUND BRINES IN SITU BY SOLAR EVAPORATION

Abraham Sadan, 4353 Diana Way, Salt Lake City, Utah 84117

Filed Feb. 20, 1975, Ser. No. 551,395

Int. Cl.[2] B01D *1/00, 9/02;* C01D *3/06, 7/00*

U.S. Cl. 159—47 R **4 Claims**



1. A process for recovering salts selected from the group consisting of carbonates, sulfates, borates and chlorides of sodium and potassium from underground brine associated with a permeable ore body comprising the steps of:

establishing at least one well communicating with the brine of said ore body,

pumping brine via said well to the surface of the ore body to accumulate a confined body of brine over said ore body exposed to solar evaporation,

the surface and strata of said ore body being sufficiently permeable to allow brine concentrated by solar evaporation to percolate downwardly into an underground basin associated with said permeable ore body,

subjecting said confined body of brine to solar evaporation to produce a brine of higher salt concentration,

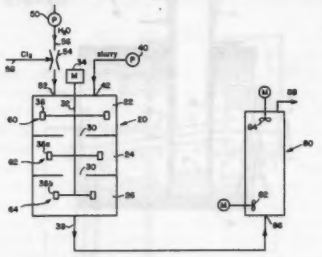
allowing the brine of said high salt concentration to percolate downwardly to an underground basin associated with said ore body,

and continuing the steps of (1) accumulating brine at the surface, (2) concentrating said brine by solar evaporation, and (3) percolating said concentrated brine to said underground basin until sufficient concentrated brine has been produced to economically optimize the recovery of chemicals therefrom.

3,966,542
MULTI-STAGE BLEACHING OF PULP USING SUCCESSIVELY LOWER POWER LEVELS

James Y. Oldshue, Rochester, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Sept. 20, 1974, Ser. No. 507,892
Int. Cl.² D21C 3/26, 9/12
U.S. Cl. 162—57 9 Claims



1. A process for bleaching pulp in a tank comprising the steps of:

a. supplying a pulp slurry to a first tank compartment;
b. supplying an oxidizing agent to said first tank compartment;
c. agitating a mixture of said pulp slurry and oxidizing agent in said first tank compartment at a first power level;
d. supplying said mixture to another tank compartment; and
e. re-agitating said mixture in said another tank compartment at a second power level that is lower than said first power level and corresponds to the amount of unreacted oxidizing agent and unreacted pulp slurry.

3,966,543
ENZYME-TREATED PAPER

Theodore Cayle, Lake Forest, and Gerard J. Moskowitz, Buffalo Grove, both of Ill., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Oct. 30, 1972, Ser. No. 302,323
Int. Cl.² D21D 3/00
U.S. Cl. 162—158 5 Claims

1. A process for improving the disintegratability of moistened paper comprising applying a dilute aqueous solution of a cellulase enzyme complex containing at least about five units each of C_1- and C_x-components of enzyme activity per ml. of said solution to newly formed paper after leaving the forming section but prior to entering the drying section so that said paper contains from about 75% to about 80% water after said application, followed by drying in which the temperature of said paper is not raised above about 100°C, the amount of said complex being such as to provide at least about 50 C_1 units per gram of paper.

3,966,544
GUIDE SHOWER FOR A FABRIC BELT

Henry Johnson, Quebec, Canada, assignor to JWI Ltd., Montreal, Canada

Filed Dec. 23, 1974, Ser. No. 536,924
Claims priority, application United Kingdom, Jan. 9, 1974, 945/74
Int. Cl.² D21F 1/42
U.S. Cl. 162—199 24 Claims

22. A method for guiding an endless fabric belt of a paper making machine, the fabric belt being driven by a driving roll;

said endless fabric belt comprising a high tension portion and a low tension portion, and right and left edges adjacent the right and left side of the machine respectively;

said high tension portion being disposed in that portion of the belt preceding said driving roll in the direction of travel of said belt;

said low tension portion being disposed in that portion of the belt following said driving roll in the direction of travel of said belt;

and guide shower disposed across the width of the endless fabric belt, and comprising a series of nozzles joined by a pipe;

the method comprising providing fluid under pressure through said pipe to outlet ends of those nozzles directed towards the left edge of said endless fabric belt;

and providing fluid under pressure through said pipe to the outlet ends of those nozzles directed towards the right edge of said endless fabric belt;

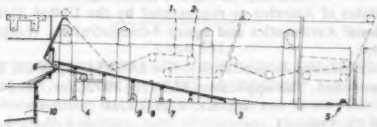
adjusting the pressure at the outlet ends of the nozzles directed towards the left edge to a different pressure from the pressure at the outlet ends of the nozzles directed towards the right edge;

whereby the belt will be guided to the side of the higher pressure.

3,966,545
DEVICE FOR THE REMOVAL OF MACULATURE OR SIMILAR

Kurt A. Banner, Goteborg, Sweden, assignor to Mekantransport AB, Goteborg, Sweden

Filed Jan. 28, 1975, Ser. No. 544,787
Claims priority, application Sweden, Jan. 28, 1974, 7401034
Int. Cl.² D21F 1/66
U.S. Cl. 162—264 5 Claims

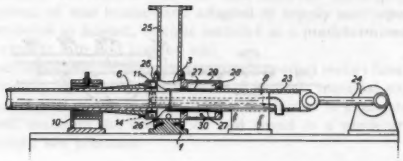


1. In a paper manufacturing machine, a device for the reception and removal of maculature collecting underneath the paper web in said machine comprising a cloth, stretchable in the space underneath the machine, a winding roller, driven by driving means and connected with one end of said cloth and arranged to wind up the cloth for the purpose of removing the cloth with the maculature collected thereon from said space leaving the same free, a discharge station for the discharge of the maculature over a linked portion of the cloth when being wound up, and a pulling device connected with the opposite end of said cloth by means of two wires and arranged to unwind the cloth from the winding roller and stretch the cloth in said space underneath the paper machine, said pulling device comprising a shaft which is rotatable by driving means in order to wind up said wires.

3,966,546
APPARATUS FOR MANUFACTURING SLEEVES FROM FIBER PULP

Terje Braaten, Ed, Sweden, assignor to Renee Engell, Oslo, Norway

Filed May 10, 1974, Ser. No. 469,042
Int. Cl.[2] D21F 1/00
U.S. Cl. 162—293 7 Claims



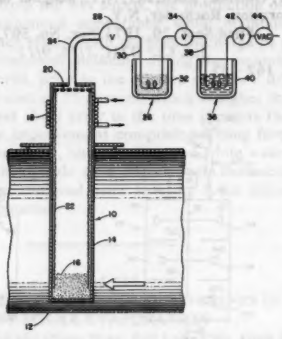
1. An apparatus for the manufacture of sleeves of fiber pulp comprising:
- first dewatering means including suction means for dewatering the fiber pulp;
- nozzle means for discharging the sleeves of fiber pulp, said nozzle means having a tubular nozzle body, a portion of the interior surface of said nozzle body including an annular first screen member which acts as a portion of said first dewatering means;
- a mandrel extending longitudinally through said nozzle body;
- second dewatering means including suction means for dewatering the fiber pulp; and
- reciprocable piston means which is reciprocable along a given axis for driving the fiber pulp through said nozzle means, said reciprocable piston means being mounted on said mandrel, wherein one end of said reciprocal piston means includes a surface which extends radially outward from said mandrel, is spaced from said axis and exerts a pressure force on the fiber pulp through said nozzle means, said surface of said one end of said reciprocable piston means including a second screen member acting as a portion of said second dewatering means.

3,966,547
METHOD OF PRODUCING ^{123}I

James W. Blue, Bay Village, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 247,434, April 25, 1972, abandoned. This application Mar. 13, 1973, Ser. No. 340,863
Int. Cl.[2] G21G 1/10
U.S. Cl. 176—11 5 Claims

1. In a method of producing high purity radioactive ^{123}I by the decay of ^{123}Xe, the improvement comprising the steps of
- bombarding ^{133}Cs contained in one end of a heat pipe with a beam of high energy protons having energies greater than 200 MeV causing a spallation reaction which produces xenon vapor and radioactive iodine contaminants while heating said ^{133}Cs and vaporizing the same,
- transporting said vaporized ^{133}Cs out of said beam to the end of said heat pipe opposite said beam,
- cooling said end of said heat pipe opposite said beam so that said vaporized ^{133}Cs condenses,
- transporting said condensed ^{133}Cs back to said one end of said heat pipe in said beam for additional bombardment,
- removing said radioactive iodine contaminants and said xenon vapor from said cooled end of said heat pipe,
- separating said radioactive iodine contaminants from said xenon vapors,
- condensing said xenon vapor in a container after said radioactive iodine contaminants have been removed therefrom, and

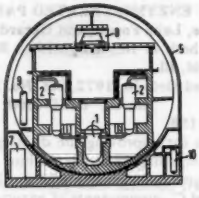


- holding the xenon in said container for a period of time sufficient for ^{123}Xe to decay ^{123}I.

3,966,548
COOLING SYSTEM FOR A NUCLEAR REACTOR

Klaüs Muller, Grossdechsendorf, and Bernhard Böhm, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 15, 1973, Ser. No. 332,737
Claims priority, application Germany, Feb. 19, 1972, 2207870
Int. Cl.[2] G21C 9/00
U.S. Cl. 176—37 6 Claims



1. A reactor installation comprising a pressure containment enclosure enclosing a normally closed main cooling circuit comprising a pressurized-water reactor pressure vessel and means for cooling and for circulating pressurized-water coolant through said vessel, and a fuel-element storage well in said enclosure for storing used hot fuel elements removed from said vessel, said well having an open top exposed to the atmosphere inside of said enclosure, said installation having circulating means for circulating fuel-element cooling water through said well while maintaining at least a fuel-element-covering water level in the well; wherein the improvement comprises said fuel-element storage well containing an excess of said fuel-element cooling water extending upwardly to a height substantially above said fuel-element covering level, and a supplemental circuit comprising means for pumping at least a portion of said excess of said fuel-element cooling water from said well into said main cooling circuit to provide this main cooling circuit with supplemental coolant, said supplemental circuit connecting with said well above said level to pump from said well at most only said excess water into said main cooling circuit by means of said circulating pump.

3,966,549
PRESSURIZED-WATER COOLANT REACTOR INSTALLATION

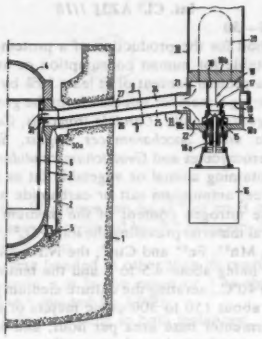
Eberhard Michel, Nurnberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 4, 1973, Ser. No. 421,681

Claims priority, application Germany, Dec. 15, 1972, 2261477

Int. Cl.² G21C *15/12*

U.S. Cl. 176—65 **2 Claims**



1. A pressurized-water reactor installation comprising a vertical reactor pressure vessel with an upper portion having at least one coolant connection with a horizontal dividing wall, said vessel internally having means for conducting coolant from below said wall downwardly into the vessel and then upwardly for discharge above the wall, a coolant pipe connected to and extending from the vessel's said connection and containing a horizontal partition wall extending throughout its length and connected with said dividing wall of the vessel's connection, a vertical steam generator positioned adjacent to said vessel, said generator having a lower portion having a coolant connection with which said pipe is connected and internally having a horizontal tube sheet above the generator's said connection and a horizontal partition below the tube sheet and horizontally aligned with and connected with the pipe's said horizontal partition wall and having a vertical partition wall extending upwardly to said tube sheet transversely with respect to the generator's said connection and forming horizontally separated spaces below the tube sheet and above the generator's horizontal partition, one of said spaces being adjacent to and connected to said pipe above its said horizontal partition wall, the generator's said horizontal partition forming a lower space therebelow, a vertical coolant pump vertically positioned in said lower space and discharging thereinto and having a suction inlet connected to the other of said spaces, said lower space being connected with said pipe below its said partition wall, and a vertical motor for driving said pump and positioned below and outside of the generator's said lower portion, a vertical shaft extending through said lower portion and interconnecting said motor and pump.

3,966,550
REACTOR FUEL ASSEMBLIES

Ronald B. Foulds; Alvin H. Kasberg, both of Murrysville; Karl H. Puechl, Export, and Melvin L. Bleiberg, Pittsburgh, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 125,544, March 18, 1971, abandoned. This application Feb. 26, 1973, Ser. No. 335,998

Int. Cl.² G21C *3/18*

U.S. Cl. 176—78 **7 Claims**

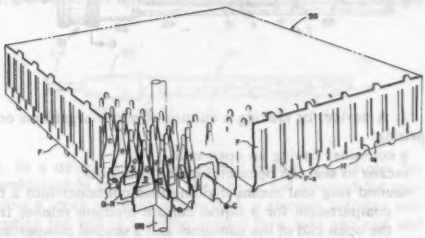
1. In a nuclear reactor fuel array, improved means comprising:

a plurality of parallel nuclear fuel rods;

a plurality of grid spacers axially spaced along the length of said fuel rods;

column support strips and row support strips associated to define a plurality of square openings orthagonally and egg-crate arranged within each grid spacer, the corresponding square openings of the axially spaced grid spacers defining for each fuel rod a longitudinal predominantly open compartment having a square cross section, said openings consisting of a few peripheral openings around the periphery of the grid support and many non-peripheral openings, there being many non-peripheral compartments and a few peripheral compartments;

four fingers integrally extending from a set of four edges of each of said non-peripheral square opening, such fingers extending in directions approximately parallel to the fuel rods extending through said non-peripheral square openings;



a bowed portion at a cantilevered end portion of each of said fingers, said bowed portion extending into a compartment;

a bowed finger portion welded back-to-back at its ends to the bowed portion of said integral finger cantilevered from a support strip, said bowed finger extending into a compartment adjacent to the compartment receiving said bowed portion of the finger, each fuel rod in one of said non-peripheral compartments being resiliently contacted by halves of four paired-bow springs thus extending into said compartment for said fuel rod, and each of the non-peripheral paired-bow springs resiliently contacting fuel rods in two adjacent compartments, said grid spacers providing each of said rods only with resilient supporting contacts, the paired-bow springs being constructed and arranged to permit both radial expansion and axial expansion of each of said rods and to permit convenient axial insertion and removal of each of said rods.

3,966,551
METHOD FOR PREPARING TANNABLE PELTS FROM ANIMAL SKINS AND HIDES

Rolf Monsheimer, Darmstadt-Eberstadt, and Ernst Pfleiderer, Darmstadt-Arheilgen, both of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed Jan. 28, 1975, Ser. No. 544,794

Claims priority, application Germany, Feb. 1, 1974, 2404789

Int. Cl.² C12B *1/00*

U.S. Cl. 195—6 **3 Claims**

1. In a process for the preparation of tannable pelts from animal skins or hides wherein concurrent soaking, unhairing, opening up of the hide structure, and bating are effected in a single procedural step by treatment with enzymes in an aqueous bath containing enzymes, the improvement wherein the enzymatic treating bath is free of amines and comprises dissolved therein:

a. an effective amount of at least one member selected from the group consisting of a fungus protease whose optimum efficacy towards casein is at a pH above 7.0, trypsin, papain, and a bacterial protease whose optimum efficacy is at a pH between 6 and 9;

b. an effective amount of a bacterial protease having an optimum efficacy against hemoglobin at a pH above 9; and

c. an effective amount of thioglycolic acid or a salt thereof.

3,966,552

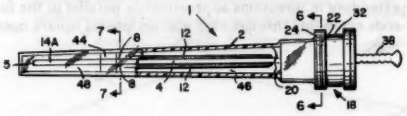
DEVICE FOR MAKING A CULTURE OF MICRO-ORGANISMS

Joseph F. Pagano, Paoli, and Ronald J. Schoengold, Thorndale, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Apr. 14, 1975, Ser. No. 567,696

Int. Cl.² C12B 1/02

U.S. Cl. 195—139 7 Claims



1. A device for making a culture of micro-organisms comprising:

a container having an open end,

means to seal the open end of the container,

second ring seal means dividing said container into a first compartment for a liquid culture medium remote from the open end of the container and a second compartment adjacent the open end of the container,

a removable elongated member in the container,

said elongated member having a portion extending through the second compartment and into said first compartment and removably engaging the second seal means to seal liquid culture medium in the first compartment, and

a culture medium secured to a portion of said elongated member lying in the second compartment.

3,966,553

PROCESS FOR PRODUCING CITRIC ACID BY FERMENTATION

Jean-Max Charpentier, Montesson; Georges Glikmans, Meudon-la-Foret, and Paul Maldonado, Chatou, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activites Petrolieres Elf, Rueil-Malmaison, France

Filed Dec. 6, 1973, Ser. No. 422,568

Claims priority, application France, Dec. 6, 1972, 72.43480; Dec. 8, 1972, 72.43936

Int. Cl.² C12B 1/00

U.S. Cl. 195—28 R 10 Claims

1. A process for continuously manufacturing citric acid comprising in at least one first aerated fermentation zone, continuously growing a culture of yeast capable of assimilating n-paraffins, in a medium containing all the elements required for the growth of said yeast, including at least one n-paraffin, continuously withdrawing the yeasts at such a rate that they be kept in the first fermentation zone during their development phase, continuously introducing the withdrawn yeasts into at least one second aerated fermentation zone separate and distinct from the first aerated fermentation zone and containing growth elements, but having a low content of assimilable inorganic nitrogen source, at least one nitrogeneous heterocyclic compound at a concentration of from 0.5 to 10 g/l being added to said second fermentation zone, maintaining said yeasts in said second zone for a sufficient time to excrete citric acid and separating the citric acid and the yeasts from the culture medium of said second zone, the dilution rate being from 0.15 to 0.2 h^{-1} in said first fermentation zone, and 0.1 to 0.04 h^{-1} in said second fermentation zone, the cell concentration in both fermentation zones being about 20 g/l.

3,966,554

PROCESS FOR THE PRODUCTION OF A PROTEIN-VITAMIN CONCENTRATE BY USING YEASTS FROM ANIMAL OR VEGETABLE FATS AND FOR ITS TRANSFORMATION INTO A PRODUCT

Károly Vass; György Kárpáti; Éva Széchenyi-Márton, and Ferenc Simek, all of Budapest, Hungary, assignors to Novex RT, Hungary

Filed June 20, 1973, Ser. No. 371,706

Claims priority, application Hungary, June 20, 1972, KO-2520

Int. Cl.² A23J 1/18

U.S. Cl. 195—30 4 Claims

1. A method for the production of a protein-vitamin concentrate suitable for human consumption or animal feeding and having a protein content of at least 50% by weight, comprising culturing a member selected from the group consisting of *Candida guilliermondic*, *Candida tropicalis*, *Candida lipolytica*, *Candida utilis*, *Saccharomyces fragilis*, *Saccharomyces lactis*, Deuteromycetes and *Geotrichum candidum* in a culture medium containing animal or vegetable fat as a carbon and energy source, ammonium salt or carbamide as a source of nitrogen, the nitrogen content of the medium being 0.1 to 0.2%, mineral material providing the ions PO_4^{3-}, Cl^-, K^+, Na^+, Mg^{2+}, Ca^{2+}, Mn^{2+}, Fe^{2+} and Cu^{2+}, the N:P ratio being about 4:1, the pH being about 4.5 to 5 and the temperature being about 30° to 40°C., aerating the culture medium at an aeration intensity of about 150 to 300 cubic meters of air per square meter of fermenter base area per hour, and separating the resulting biomass from the culture medium.

3,966,555

ALPHA-GALACTOSIDASE PRODUCTION

Nichole Arnaud, Vendome, France, and David Anthony Bush, Maidstone, England, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Jan. 30, 1975, Ser. No. 545,356

Claims priority, application Switzerland, Feb. 1, 1974, 1403/74

Int. Cl.² C07G 7/028

U.S. Cl. 195—66 R 10 Claims

1. A process for the production of α-galactosidase by culturing the mold Penicillium duponti in an aqueous medium containing at least one sugar with at least one αD-galactopyranosyl bond, collecting the mycelium thus obtained and subjecting said collected mycelium to a step selected from the group consisting of lyophilization and treatment to liberate its intracellular content of α-galactosidase.

3,966,556

COMPOUNDS FOR ENZYME AMPLIFICATION ASSAY METHADONE ANALOGS

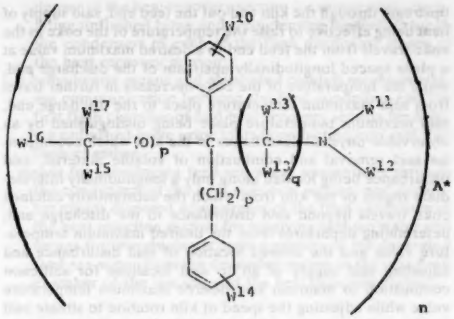
Kenneth E. Rubenstein, Palo Alto, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Division of Ser. No. 304,157, Nov. 6, 1972, Pat. No. 3,852,157, which is a continuation-in-part of Ser. No. 143,609, May 14, 1971, abandoned. This application June 20, 1974, Ser. No. 481,087

Int. Cl.² G01N 31/14; C07G 7/02

U.S. Cl. 195—63 9 Claims

1. An enzyme-bound-ligand of the formula:



wherein:

any one of the W groups can be -X* or an H of any of the W groups may be replaced by -X*, wherein -X* is a bond or a linking group;

A* is an enzyme bonded at other than its reactive site to n ligands whrein n is in the range or 1 to the molecular weight of -A* divided by 2,000;

p is 0 or 1, being the same in both instances;

q is 2 or 3;

W^{10} and W^{14} are hydrogen;

W^{11} and W_{12} are hydrogen, alkyl of from 1 to 3 carbon atoms, or may be taken together to form a 6-membered ring with the nitrogen to which they are attached;

W^{13} is hydrogen or methyl, only one W^{13} being methyl;

W^{15} is hydrogen or hydroxyl;

W^{16} is hydrogen, acyloxy of from 1 to 3 carbon atoms, or hydroxy; and

W^{17} is hydrogen or alkyl of from 1 to 3 carbon atoms.

3,966,557

ANTIBIOTIC 19,402 RP

Denise Mancy, Charenton; Leon Ninet, and Jean Preud'homme, both of Paris, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 707,233, Feb. 21, 1968, Pat. No. 3,821,366. This application Mar. 24, 1972, Ser. No. 237,993

Claims priority, application France, Feb. 22, 1967, 67.96051

Int. Cl.[2] C12D *9/00*

U.S. Cl. 195—80 R **5 Claims**

1. Process for the production of an alkali metal salt of the antibiotic 19,402 RP which comprises inoculating an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and mineral salts with a culture of the strain *Streptomyces peruviensis* NRRL 2757, allowing fermentation to take place under submerged aerobic culture conditions commencing at a pH within the range 6.0 to 7.5 and at a temperature of from 25° to 35°C until a substantial amount of 19,402 RP, together with the amphoteric antibiotic 6798 RP, is produced by the said microorganism in the said culture medium, and isolating 19,402 RP, in the form of an alkali metal salt thereof, substantially free of 6798 RP, from the culture medium by adjusting the pH of the medium to below 5, and extracting the filter cake with water containing an alcohol selected from the group consisting of methanol, ethanol and propanol at a pH of from 3 to 7.

3,966,558

DEVICE FOR COLLECTION OF SAMPLES FOR MICROBIOLOGICAL STUDIES

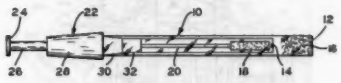
Cesar Calva-Pellicer, Copenhague No. 24, Mexico City 6, Mexico

Filed May 5, 1975, Ser. No. 574,388

Claims priority, application Mexico, Nov. 5, 1974, 154796

Int. Cl.[2] C12B *1/00*

U.S. Cl. 195—139 **5 Claims**



1. In a device for collecting and preserving samples for microbiological studies and the like; a rod adapted for supporting a swab element at one end, a stopper member surrounding the rod in a region spaced from said one end and sealingly engaging the rod, an inner tubular container closed at one end and open at the other adapted for being placed over the rod from said one end of the rod and with the open end of the inner container sealingly engaging the stopper member, an outer tubular container surrounding said inner container and having an open end sealingly engaging said stopper member and a closed end axially spaced from the closed end of the inner container, said stopper member maintaining the interiors of said containers isolated from one another and from the atmosphere.

3,966,559

APPARATUS FOR DEODORIZING OIL AND SIMILAR MATERIAL

Anthony Athanassiadis, Brussels, Belgium, assignor to Extraction de Smet, Edegem, Belgium

Filed May 14, 1974, Ser. No. 469,884

Claims priority, application Belgium, Oct. 31, 1973, 806819

Int. Cl.[2] B01D *1/00, 19/00, 35/18, 1/02*

U.S. Cl. 196—111 **12 Claims**

1. In an apparatus for deodorizing oil and similar material, said apparatus being of the type including:

a column; inlet duct means opening into an upper part of said column for supplying thereto material to be treated;

means for supplying heat injection fluid to a lower part of said column to treat said material therein; and

a gas discharge tube in said upper part of said column and adapted to be attached to an exhaust device; the improvement comprising:

a plurality of separate compartments surrounding at least a portion of said lower part of said column, said compartments being separate from, and not in fluid communication with, each other;

a plurality of first duct means, one each extending from the lowest portion of said column to one of said compartments, for allowing passage of material from said column separately to each of said compartments;

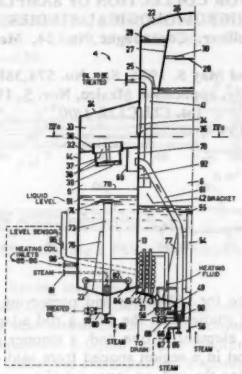
a plurality of separately controlled supply means, one each operatively associated with one of said first duct means, for supplying said material from said column through the

respective said first duct means to the respective compartment;

means for supplying heat injection fluid to each of said compartments to treat said material therein;

vapor passageway means communicating the top portion of said compartments with said upper part of said column;

a plurality of second duct means, one each leading from a respective one of said compartments, for discharging



treated material from each of said compartments to a common outlet duct connected to each of said second duct means; and

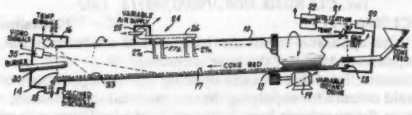
a plurality of separate control means, one each connected to one of said second duct means, for separately controlling the flow of treated material through the respective said second duct means from the respective said compartment.

3,966,560

METHOD OF CALCINING COKE IN A ROTARY KILN

Frank John Farago; Raman Radha Sood, and David Michael Stokes, all of Arvida, Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed May 6, 1974, Ser. No. 467,376
Int. Cl.[2] C10B *49/00, 49/06, 57/16*
U.S. Cl. 201—32 **13 Claims**



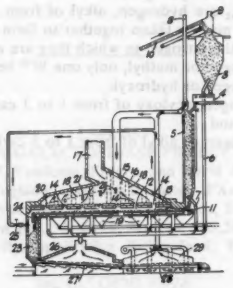
1. In a method of calcining coke which travels from the upper feed end where said coke is fed at a desired rate to the lower discharge end of a sloping, rotary kiln, which has a predetermined slope, at a speed dependent on the speed of kiln rotation, while supplying heat to the traveling coke to calcine the coke by removing volatile material and increasing substantially the real density of the coke, the improvement which comprises causing combustion of removed volatile material within the kiln to supply 75 to 100% of the heat required for said calcination after preliminary heating to initiate the process, by supplying air into the kiln at localities within a zone which extends longitudinally between places spaced substantially from the discharge and feed ends respectively, while drawing the gaseous products of said combustion upstream through the kiln and out the feed end, said supply of heat being effective to raise the temperature of the coke as the coke travels from the feed end to a desired maximum value at a place spaced longitudinally upstream of the discharge end, while the temperature of the coke decreases in further travel from said maximum temperature place to the discharge end, said maximum temperature place being distinguished by an observable physical disturbance in the kiln which accompanies said removal and combustion of volatile material, said disturbance being located along only a longitudinally intermediate region of the kiln from which the substantially calcined coke travels beyond said disturbance to the discharge end, determining departures from the desired maximum temperature value and the desired location of said disturbance and adjusting said supply of air to said localities for sufficient combustion to maintain said desired maximum temperature value while adjusting the speed of kiln rotation to situate said maximum temperature at the desired place so that the coke travels for 5 minutes or more from the downstream end of said disturbance to the discharge end, thereby insuring uniform calcining treatment of the coke before it discharges.

3,966,561

APPARATUS FOR THE CARBONIZATION OF COAL

David William Hinkley, Brighton Beach, Australia, assignor to International Oils Exploration N.L., Melbourne, Australia

Filed Sept. 23, 1974, Ser. No. 508,263
Int. Cl.[2] C10B *1/06, 7/06, 21/00*
U.S. Cl. 202—117 **18 Claims**



1. Coal carbonization apparatus comprising a travelling grate disposed within a carbonization chamber and extending from at least the inlet to the outlet end of said carbonization chamber, hot inert gas inlets disposed in said carbonization chamber below said travelling grate, a combustion chamber disposed above said travelling grate and separated from said carbonization chamber by a perforated refractory screen, air inlets being disposed within said combustion chamber adjacent said refractory screen.

3,966,562

MULTI-STAGE FLASH DISTILLATION PLANT

Toshimi Mukushi; Kenkichi Izumi; Sankichi Takahashi; Yoshiaki Okazima; Toshio Sawa, all of Hitachi, and Mithumasa Komai, Funabashi, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed July 31, 1974, Ser. No. 493,480
Int. Cl.[2] B01D *3/00*
U.S. Cl. 202—173 **6 Claims**

1. A multi-stage flash distillation plant comprising:

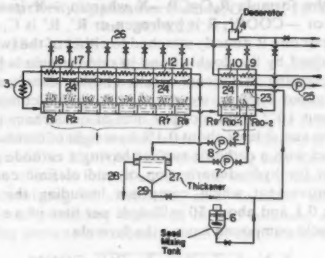
a plurality of flash distillation stages divided into a heat recovery section and a heat rejection section, each of said stages including a flash chamber and a condenser with the last stage of the heat rejection section having a front flash chamber and a rear flash chamber;

a brine circulating pump means and associated conduit means providing communication between the rear flash chamber of said heat rejection section and the first con-

denser of the heat recovery section for sequentially circulating unflashed brine and a condensing medium through the condensers of each of the flash distillation stages of the heat recovery section;

a brine heater means and associated conduit means providing communication between the final condenser and the first flash chamber of said heat recovery section for heating unflashed brine prior to its introduction into said first flash chamber;

means for introducing feed sea water sequentially through the condensers of the heat rejection section, and deaerator means disposed downstream of the final condenser of the heat rejection section for receiving said sea water and means for introducing at least a portion of the deaerated feed sea water from the deaerator means to the rear flash chamber of the last stage of the heat rejection section;



an open thickener container;

a brine extracting pump and associated conduit means for conveying the flashed and concentrated brine from the front flash chamber of the last stage of the heat rejection section to said open-type thickener container for separating the flashed and concentrated brine into clean brine containing a small amount of seeds as discharged brine and the brine containing a relatively large amount of seeds as recovered brine;

a seed mixing tank for preparing new seed-mixed brine; and

a distributor means provided with nozzle means and disposed in the rear flash chamber of the last stage of the heat rejection section and means for combining the recovered brine from the thickener container and the new seed-mixed brine and introducing the mixture to said distributor means, whereby the brine mixture is deaerated.

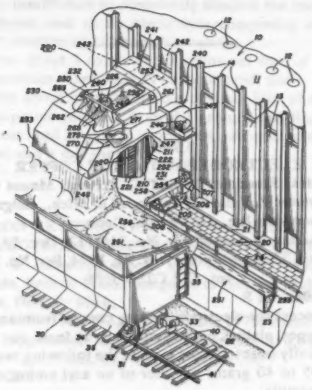
3,966,563

COKE GUIDE SPRAY SYSTEM

Frank K. Armour, Flossmoor, and Robert P. Winters, Olympia Fields, both of Ill., assignors to Interlake, Inc., Chicago, Ill.

Filed Sept. 27, 1973, Ser. No. 401,188
Int. Cl.² C10B *39/02, 27/04, 39/12*
U.S. Cl. 202—228 **3 Claims**

1. A coke guide spray system for use with a battery of coke ovens having a corresponding plurality of coke side doors disposed in a row with a coke guide track arranged generally parallel thereto and with a coke quenching car track arranged beside and generally parallel to the coke guide track and at an elevation therebelow with a coke quenching car thereon and movable therealong, said system comprising a coke guide including an outer frame mounted on the coke guide track for movement of said coke guide from one coke side door to another, a track mounted on said outer frame and arranged transversely with respect to the coke guide track, a coke guide chute mounted on said transverse track for movement toward and away from an associated coke side door, said coke guide guiding coke from an associated open coke side door across the coke guide track and into a coke quenching car on the coke quenching car track, a hood mounted on said coke guide and covering said coke guide chute and extending outwardly over the associated coke quenching car, a water inlet pipe mounted on said coke guide and adapted to be connected to a source of water under pressure, water spray means mounted within said hood above said coke guide chute adjacent to the end thereof disposed toward the associated coke quenching car for spraying water on the upper surface of a column of coke as it falls into the associated coke quenching car and for spraying water into the portion of said hood disposed over the associated coke quenching car, a gas exhaust system mounted on said coke guide and including an intake duct communicating with the interior of said hood and a fan connected to said intake duct and an outlet duct connected to said fan and discharging into said associated coke quenching car, and a horizontally disposed condensing spray system in said outlet



duct for spraying a horizontal stream of water therein to entrain fumes and particulate matter passing through said outlet duct and depositing the same in the associated coke quenching car, said hood and said water spray means and said exhaust system and said condensing spray system cooperating to trap emissions from the associated coke oven during discharge thereof in the water from said water spray means and condensing spray system and to direct the water and the emissions trapped therein onto the coke in the coke car and to retain the water therein, whereby to minimize emissions into the atmosphere from the hot coke as it is pushed from an oven through the associated coke side door and said coke guide into the coke quenching car.

3,966,564

METHOD OF ELECTRODEPOSITING AN ALLOY OF TIN, COBALT AND A THIRD METAL AND ELECTROLYTE THEREFOR

Jacob Hyner, and Robert A. Michelson, both of Waterbury, Conn., assignors to Whyco Chromium Company Inc., Thomaston, Conn.

Division of Ser. No. 431,025, Jan. 7, 1974, Pat. No. 3,881,919.
This application Dec. 17, 1974, Ser. No. 533,472
Int. Cl.² C25D *3/60, 3/56*
U.S. Cl. 204—43 S **15 Claims**

1. An acidic, aqueous bath for the formation of a bright, tarnish resistant and color stable coating, containing a tin compound providing stannous ions, a cobalt compound providing cobaltous ions and at least one third compound providing ions of a third metal, said third metal being antimony or a metal other than aluminum selected from Periodic Group II_B, III_A or VI_B, said ions being present in amounts sufficient to electrodeposit from said bath at pH of about 1–3, a current density of about 5–45 A/ft.² and bath temperature of about 50°–85° C., a ternary alloy consisting essentially of about

40–90 wt. % tin, about 10–50 wt. % cobalt and about 1–28 wt. % at least one of said third metals.

11. A process for forming on a substrate a bright, tarnish resistant and color stable coating of an alloy consisting of about 40–90 wt. % tin, about 10–50 wt. % cobalt and about 1 to 28 wt. % of at least one third metal other than aluminum selected from Periodic Groups II_B, III_A or VI_B, which comprises electroplating said alloy from an acidic, aqueous bath at a pH of about 1–3, a current density of about 5–45 A/ft.^{2} and a bath temperature of about 50°–85°C, said bath containing about 20–100 g/l of a tin compound providing stannous ions, about 20–400 g/l of a cobalt compound providing cobaltous ions, and about 5–175 g/l of at least one third compound providing ions of said third metal.

3,966,565

ELECTRODEPOSITION OF COPPER

Otto Kardos, Ferndale; Donald A. Arcilesi, Mount Clemens, and Silvester P. Valayil, Pontiac, all of Mich., assignors to M & T Chemicals Inc., Greenwich, Conn.

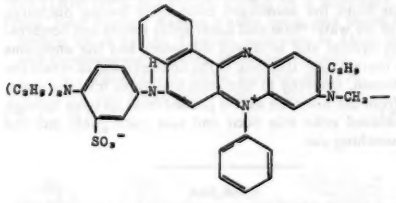
Continuation-in-part of Ser. No. 315,112, Dec. 14, 1972, abandoned. This application Nov. 21, 1974, Ser. No. 525,717

Int. Cl.^{2} C25D *3/38*

U.S. Cl. 204—52 R **6 Claims**

1. A process for electrodepositing copper from an aqueous acidic copper plating bath containing at least one member independently selected from each of the following two groups:

A. 0.005 to 40 grams per liter of an aryl amine exhibiting the formula:



and

B. sulfoalkyl sulfide compounds containing the grouping —S—Alk—SO_3M where M is one gram-equivalent of a cation and —Alk— is a divalent aliphatic hydrocarbon group of 1 to 8 carbon atoms in an amount of 0.01 milligrams per liter to 1000 milligrams per liter.

3,966,566

ELECTROLYTIC HYDRODIMERIZATION PROCESS IMPROVEMENT

J. Harvey Lester, Jr., Pensacola, and James S. Stewart, Cantonment, both of Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 497,808, Aug. 15, 1974, Pat. No. 3,898,140, which is a continuation-in-part of Ser. No. 385,767, Aug. 6, 1973, abandoned, which is a continuation-in-part of Ser. No. 347,948, April 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 285,975, Sept. 5, 1972, abandoned. This application July 25, 1975, Ser. No. 599,255

The portion of the term of this patent subsequent to Aug. 5, 1992, has been disclaimed.

Int. Cl.^{2} C25B *3/10*

U.S. Cl. 204—73 R **10 Claims**

1. In a process for hydrodimerizing an olefinic compound having the formula $R_2C{=}CR{-}X$ wherein —X is —CN, —$CONR_2$ or —COOR′, R is hydrogen or R′, R′ is C_1–C_4 alkyl and at least one R directly attached to either of the two carbon atoms joined by the double bond in said formula is hydrogen by electrolyzing an aqueous solution having dissolved therein at least about 0.1% by weight of said olefinic compound, at least about 10^{-5} gram mol per liter of quaternary phosphonium ions and at least about 0.1% by weight of conductive salt in contact with a cathodic surface having a cathode potential sufficient for hydrodimerization of said olefinic compound, the improvement which comprises including the solution between 0.1 and about 50 millimols per liter of a nitrilocarboxylic acid compound having the formula

$$Y_2N{-}(-Z{-}YN{-})_n{-}R''{-}COOM$$

wherein Y is hydrogen, —R″—COOM, —$(-CH_2-)_{m+1}$—OH or C_1—C_{20} alkyl; —R″— is —$(-CH_2-)_m$— or —$(-CHR'''-)$—: R‴ is hydroxy, —COOM, —$(-CH_2-)_m$—COOM or C_1—C_8 alkyl, hydroxyalkyl or hydroxyphenyl; Z is a divalent C_2—C_5 hydrocarbon radical; M is hydrogen, alkali metal or ammonium; m is 1 or 2; n is an integer from 0 to 4 and at least one Y is —R″—COOM or —$(-CH_2-)_{m+1}$—OH)

3,966,567

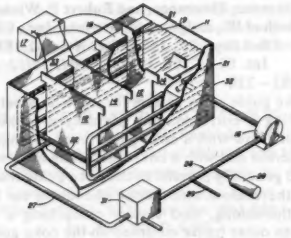
ELECTROLYSIS PROCESS AND APPARATUS

Gerald F. Pace, Casa Grande, Ariz.; John C. Stauter, Arlington Heights, Ill.; Calvin N. Armstrong, and Gary R. Harris, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Oct. 29, 1974, Ser. No. 518,842

Int. Cl.^{2} C25C *1/12*, *7/00*

U.S. Cl. 204—105 R **4 Claims**



1. An improved apparatus for electrolyzing ions in an aqueous electrolyte comprising an electrolysis cell containing said electrolyte; electrodes immersed in said electrolyte, said electrodes being at least one anode and at least one cathode; a current supply means connected to said electrodes for supplying an electrical direct current to said electrodes and impressing said current through said electrolyte; an electrolyte circulating means fluidly communicating with said cell; a reagent

injection means and a temperature control means fluidly communicating with said electrolyte circulating means; and, electrolyte distributor means secured to two parallel side portions of said cell and fluidly communicating with said circulating means so that electrolyte distributed therethrough is directed across the face of said electrodes from two opposing directions, said electrolyte distributor means comprising a plurality of horizontally disposed conduit means each having a plurality of openings therein having a diameter of from 0.30 to 0.044 inches.

3,966,568

ELECTROWINNING OF GALLIUM

Cecil L. Crossley, Rossland; Horst E. Hirsch, Trail, both of Canada, and Shou C. Liang, Spokane, Wash., assignors to Cominco Ltd., Trail, Canada

Filed Dec. 13, 1974, Ser. No. 532,546
Claims priority, application Canada, Oct. 21, 1974, 211805
Int. Cl.² C25C *1/24*
U.S. Cl. 204—105 R 11 Claims

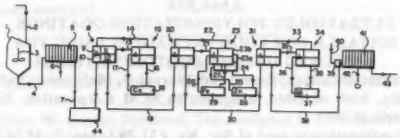
1. A process for the electrolytic recovery of gallium from an acidic, aqueous gallium trichloride solution which comprises the steps of feeding said solution containing gallium in a concentration of up to about 3 molar to electrolytic cells, electrolyzing said solution at an electrode current density in the range of about 150 to 350 A/m² and conducting said electrolysis in presence of metal ions of at least one metal chosen from the group consisting of aluminum, zinc, calcium, magnesium, sodium and potassium dissolved in said solution, said metal ions being present in a concentration of up to about 3 molar.

3,966,569

METHOD OF RECOVERING METAL FROM METALLIFEROUS WASTE

Hans Reinhardt, Vastra Frolunda, and Harald Daniel Ottertun, Molndal, both of Sweden, assignors to MX Processor Reinhardt & Co. AB, Sweden

Continuation-in-part of Ser. No. 537,905, Jan. 2, 1975, abandoned. This application Feb. 25, 1975, Ser. No. 552,923
Claims priority, application Sweden, Jan. 28, 1974, 7401085
Int. Cl.² C25C *1/08, 1/12*
U.S. Cl. 204—108 8 Claims



1. A method of recovering metal from solid metalcontaining waste, such as metal hydroxide slime, comprising leaching the waste with sulphuric acid to form a metal sulphate solution having a pH value of 0–5, contacting the metal sulphate solution in a liquid extraction process with an organic solution containing an organophosphorous acid to transfer iron and zinc from the metal sulphate solution to the organic solution, contacting the organic solution in a first washing operation with an aqueous solution containing 50–200 g/l free sulphuric acid for selectively transferring zinc from the organic solution to said aqueous sulphuric acid solution, recovering zinc from said aqueous sulphuric acid solution, contacting the organic solution in a second washing operation with an aqueous solution containing 500–1000 g/l free sulphuric acid for selectively transferring iron from the organic solution to said aqueous sulphuric acid solution, and recovering iron from said aqueous sulphuric acid solution.

3,966,570

ELECTROLYTIC POST-TREATING METHOD OF ELECTROLYTICALLY CHROMATE TREATED OR METALLIC CHROMIUM PLATED STEEL SHEET

Hidehisa Yamagishi, Yokohama; Hiroshi Takano, and Yoshitaka Kashiyama, both of Kawasaki, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed June 18, 1974, Ser. No. 480,592
Claims priority, application Japan, Jan. 14, 1974, 49-6644
Int. Cl.² C25D *5/48*
U.S. Cl. 204—140 6 Claims

1. A method for electrolytically post-treating the surface of an electrolytically chromate treated or metallic chromium plated steel sheet, which comprises anodically treating said sheet, said sheet being employed as an anode, with a quantity of electricity of from at least about 0.2 Coulomb/dm² to a quantity insufficient to completely dissolve the metallic chromium layer, and in an electrolyte comprising an aqueous solution containing (a) and (b), below:

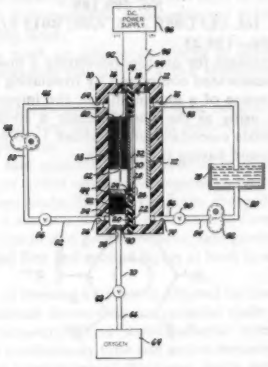
a. from about 3 to about 40 grams per liter of hexavalent chromium, expressed as chromic acid, and
b. from about 5 to about 50 grams per liter of at least one compound selected from the group consisting of an aliphatic and aromatic monobasic, dibasic and polybasic acid and a salt thereof.

3,966,571

METHOD OF OPERATING A DYNAMICALLY PACKED BED ELECTRODE ELECTROCHEMICAL CELL SYSTEM

Eugene G. Gagnon, Utica, and Kao-Wen Mao, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 463,533, April 24, 1974, abandoned. This application Sept. 3, 1975, Ser. No. 610,067
Int. Cl.² C25B *1/46, 15/00*
U.S. Cl. 204—149 2 Claims



1. A method for conducting high rate electrochemical reactions comprising the steps of:

dynamically packing conductive particles against a fluid porous, particle restraining means and in contact with an electrical conductor by rapidly flowing an electrolyte fluid through said particles and said particle restraining means;
communicating said dynamically packed particles with a spaced counterelectrode through at least one electrolyte;
interconnecting said dynamically packed particles and said counterelectrode through external circuit means to obtain high rate electrochemical reactions in said cell;

periodically stopping said rapid electrolyte fluid flow and interrupting said cell reactions to automatically unpack said dynamically packed particles;

upon each such termination, dynamically repacking said conductive particles into new particle relationships by again rapidly flowing said electrolyte fluid through said particles and said porous restraining means; and

resuming said cell reactions.

3,966,572

PHOTOCURABLE LOW GLOSS COATINGS CONTAINING SILICA AND ACRYLIC ACID

Charles H. Carder, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 11, 1975, Ser. No. 549,043

Int. Cl.[2] C08F *8/00, 2/46*

U.S. Cl. 204—159.16 **2 Claims**

1. In a photocurable acrylate-based coating or ink composition containing silica as the flatting agent, the improvement of having present in said composition from 0.1 to 10 weight percent of acrylic acid, based on the weight of the composition.

3,966,573

PHOTOPOLYMERIZATION CO-INITIATOR SYSTEMS

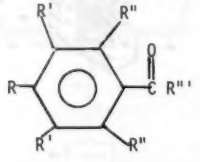
Anthony J. Bean, East Rutherford, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Division of Ser. No. 519,579, Oct. 31, 1974, Pat. No. 3,933,682, which is a continuation-in-part of Ser. No. 328,442, Jan. 31, 1973, abandoned. This application July 23, 1975, Ser. No. 598,188

Int. Cl.[2] C08F *2/46, 4/00*; B01J *31/02*

U.S. Cl. 204—159.23 **5 Claims**

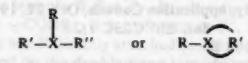
1. In a process for photopolymerizing a monomeric ethylenically unsaturated compound by irradiating the compound in the presence of a photoinitiator, the improvement which comprises using as the photoinitiator a co-initiator system which consists essentially of (a) about 1–30 parts of at least one compound having the formula



wherein R, R′, and R″ is each hydrogen, C_{1-14} alkyl, aryl, alkylaryl, alkoxy, aryloxy, halogen, halogenated C_{1-14} alkyl, halogenated aryl, amino, or amino N-substituted with alkyl, aryl, β-alkanol, or a combination of these, and may be the same or different; and R‴ is hydrogen, C_{1-14} alkyl, halogenated alkyl, aryl, —OZ where Z is C_{1-14} alkyl or aryl;

where Y is hydrogen, C_{1-14} alkyl, aryl, or alkylaryl and Q is hydrogen, C_{1-14} alkyl, aryl, alkylaryl, alkoxy, or aryloxy: or

wherein R, R′, and R″ is each hydrogen, C_{1-14} alkyl, aryl, alkylaryl, alkoxy, aryloxy, halogen, halogenated C_{1-14} alkyl, halogenated aryl, amino, or amino N-substituted with alkyl, aryl, β-alkanol, or a combination of these, and may be the same or different; (b) about 1–30 parts of at least one compound having the formula



wherein X is nitrogen, phosphorus, arsenic, bismuth, or antimony and R, R′, and R″ is each alkyl, hydroxyalkyl, aryl, aralkyl, or alkaryl and may be the same or different and one or both of R and R″ may be hydrogen; and (c) 1–30 parts of at least one halogenated hydrocarbon.

3,966,574

ULTRAVIOLET POLYMERIZATION COATINGS SUITABLE FOR FOOD PACKAGING USING FDA APPROVED DYES AS PHOTOSENSITIZERS

John David LaBash, Berea, and Vincent D. McGinniss, Valley City, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 431,282, Jan. 7, 1974, abandoned. This application June 30, 1975, Ser. No. 591,644

Int. Cl.[2] C08F *2/46, 4/00*

U.S. Cl. 204—159.24 **16 Claims**

1. In a process for photopolymerizing a composition comprising a photopolymerizable ethylenically unsaturated vehicle and a photoinitiator system containing a photosensitizer and 2–10% by weight of an organic amine activator by exposure to ultraviolet radiation, the improvement, rendering said composition suitable for food associated applications, comprising incorporating into said composition as said photosensitizer 0.5–5% by weight based on the weight of the composition of a dye formulation consisting essentially of 9-(o-carboxyphenyl)-6-hydroxy-2,4,5,7-tetraiodo-3H-xanthene-3-one, disodium salt (FD&C red No. 3) in combination with at least one azo dye selected from the group consisting of trisodium salt of 1-(4-sulfo-1-naphthylazo)-2-naphtol-3,6-disulfonic acid (FD&C red No. 2) and 6-hydroxy-5-[(2-methoxy-5-methyl-4-sulfophenyl)azo]-2-naphthalenesulfonic acid disodium salt (FD&C red No. 40).

3,966,575

METHOD FOR REMOVING LIQUID FROM BEARING MATERIAL

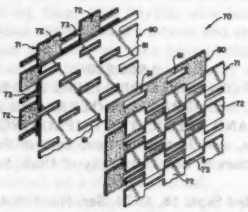
James T. Candor, 5440 Cynthia Lane, Dayton, Ohio 45429

Continuation-in-part of Ser. No. 499,178, Aug. 21, 1974, and a continuation-in-part of Ser. No. 548,666, Feb. 10, 1975, which is a continuation-in-part of Ser. No. 383,255, July 27, 1973, Pat. No. 3,849,275, which is a division of Ser. No. 263,605, June 16, 1972, Pat. No. 3,795,605, which is a continuation-in-part of Ser. No. 53,402, July 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 25,938, April 6, 1970, Pat. No. 3,687,834, which is a continuation-in-part of Ser. No. 864,851, Oct. 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 811,421, March 28, 1969, abandoned, said Ser. No. 548,666, is a continuation-in-part of Ser. Nos. 469,820, May 14, 1974, and Ser. No. 405,023, Oct. 10, 1973, and Ser. No. 499,178, Aug. 21, 1974. This application Apr. 21, 1975, Ser. No. 569,815

The portion of the term of this patent subsequent to Nov. 19, 1991, has been disclaimed.

Int. Cl.[2] B01D *13/02*

U.S. Cl. 204—180 R 10 Claims



1. A method of treating moisture bearing material comprising the steps of creating a plurality of non-uniform electrostatic fields with each field having the higher intensity portion thereof substantially oppositely located relative to the higher intensity portion of an adjacent non-uniform field, and disposing said material so that said non-uniform fields at least partially extend across said material to act on at least part of the moisture thereof to move at least part of said moisture relative to said material.

3,966,576

ELECTROPHORETIC DEPOSITION OF ASBESTOS DIAPHRAGMS

William W. Carlin, Portland, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 15, 1974, Ser. No. 488,871

Int. Cl.[2] C25B *11/00, 13/06;* C25D *13/02*

U.S. Cl. 204—181 16 Claims

1. In a method of assemblying a chlor-alkali diaphragm cell wherein an electrolyte permeable first electrode having an aqueous sodium chloride brine permeable asbestos diaphragm thereon and a second electrode are inserted in a cell body, the improvement wherein the aqueous sodium chloride brine permeable diaphragm is deposited by the method comprising:

A. placing the first electrode in an aqueous liquid composition comprising (1) chrysotile asbestos at a concentration below 1.0 weight percent to avoid formation of asbestos fiber agglomerates and high enough to allow electrophoretic deposition and having a nominal fiber length short enough to remain in suspension and long enough to form a porous deposited diaphragm, and (2) sufficient surfactant to transport the asbestos and reduce the surface tension of the liquid composition while maintaining the pH thereof above the isoelectric point of asbestos;

B. maintaining said liquid composition basic; and

C. maintaining an electrical potential above about 150 volts between the first electrode and a second electrode in said liquid composition to provide an electrophoretic current density.

3,966,577

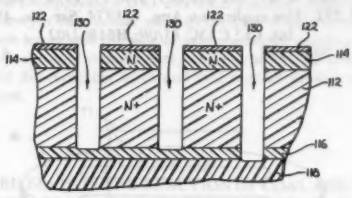
DIELECTRICALLY ISOLATED SEMICONDUCTOR DEVICES

Arthur K. Hochberg, Torrance, Calif., assignor to TRW Inc., Los Angeles,, Calif.

Division of Ser. No. 392,039, Aug. 27, 1973, abandoned. This application May 3, 1974, Ser. No. 466,722

Int. Cl.[2] C23C *15/00;* H01L *21/302, 21/314*

U.S. Cl. 204—192 4 Claims



1. A method of forming a structure adapted for construction of integrated circuit devices on an epitaxial wafer having a first layer of monocrystalline semiconductor material of a predetermined conductivity type and active impurity concentration and of a predetermined thickness, and a second layer of epitaxially deposited monocrystalline semiconductor material of the same conductivity type, but of a lower concentration of active impurities than that of said first layer, said second layer being substantially thinner than said first layer, including the steps of:

a. forming an isolating layer on said first layer of said wafer;

b. forming a polycrystalline semiconductor material onto said isolating layer;

c. forming a mask on said second layer to define groove regions between a plurality of active semiconductor regions;

d. diffusing impurity dopants of the same conductivity type as that of said first layer into said groove region of said second layer; and

e. removing said semiconductor material in said first and second layer within said groove regions by bombardment of said semiconductor material with charged particles accelerated across a potential difference to form a plurality of grooves in said groove regions, said groove extending into said first and second layers at least to said isolating layer.

2. A method of forming a structure adapted for construction of integrated circuit devices on an epitaxial wafer having a first layer of monocrystalline semiconductor material of a predetermined conductivity type and active impurity concentration and of a predetermined thickness, and a second layer of epitaxially deposited monocrystalline semiconductor material of the same conductivity type, but of a lower concentration of active impurities than that of said first layer, said second layer being substantially thinner than said first layer, including the steps of:

a. forming an isolating layer on said first layer of said wafer;

b. forming a polycrystalline semiconductor material onto said isolating layer;

c. forming a first mask on said second layer to define groove regions between a plurality of active semiconductor regions and to define a plurality of contact regions in each active semiconductor region;

d. diffusing impurity dopants of the same conductivity type as that of said first layer into said groove regions of said

second layer and into said plurality of contact regions to form a plurality of contact strips and a plurality of regions having substantially the same susceptibility for removal as said first layer;

e. forming a second mask on said second layer and first mask to redefine said plurality of groove regions; and

f. removing said semiconductor material in said first and second layers by bombardment with charged particles to form a plurality of grooves in said redefined groove regions each of said grooves extending into said first and second layers at least to said isolating layer.

3,966,578

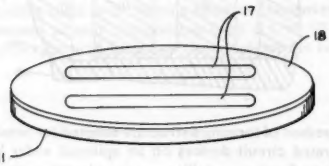
METHOD OF MAKING THIN FILM THERMISTOR

Alfred Sommer, Teaneck, N.J., assignor to Ceramic Magnetics, Inc., Fairfield, N.J.

Division of Ser. No. 434,067, Jan. 17, 1974, Pat. No. 3,851,291. This application Aug. 1, 1974, Ser. No. 493,906

Int. Cl.² C23C *15/00*; H01B *1/02*

U.S. Cl. 204—192 **6 Claims**



1. The method of forming a thin film thermistor comprising the steps of:

a. preparing a substrate of thin polyimide film;

b. placing a mask over said film to define areas upon which thermistor material is to be deposited;

c. placing said film and said mask in a sputtering chamber and sputtering a thermistor material consisting of lead teleuride plus approximately 5% cerium on to said thin film; and

d. depositing metal electrodes on said film to provide electrical contact to the thermistor material deposited thereon.

3,966,579

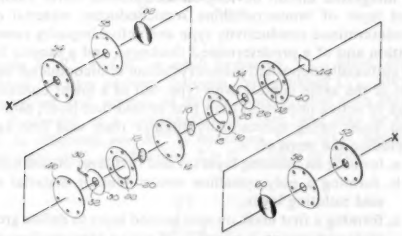
APPARATUS FOR MEASURING ALCOHOL CONCENTRATIONS

Kuo Wei Chang, 485 Massachusetts Ave., Lexington, Mass. 02173, and Sol Aisenberg, 36 Bradford Road, Natick, Mass. 01760

Filed Mar. 20, 1974, Ser. No. 453,064

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 R **11 Claims**



1. An electrochemical fuel cell analyzer for detecting the presence of alcohol, comprising:

an anode having an active catalytic surface for electrooxidizing impinging alcohol molecules;

a cathode having an active catalytic surface for electroreducing oxygen molecules;

ion exchange means impermeable to electrolyte separating said anode and cathode positioned on opposite sides thereof;

an aqueous electrolyte maintained between said anode and cathode active surfaces; and,

low impedance circuit means connected between said anode and cathode substantially eliminating voltage differences across said cell to provide a short circuit current output and includes means for measuring the flow of said short circuit current

whereby a low impedance ion exchange path is formed in said cell between said anode and cathode upon oxidation of alcohol at said anode and reduction of oxygen at said cathode.

3,966,580

NOVEL PROTEIN-IMMOBILIZING HYDROPHOBIC POLYMERIC MEMBRANE, PROCESS FOR PRODUCING SAME AND APPARATUS EMPLOYING SAME

Jiri A. Janata, and Jarmila Janata, both of Salt Lake City, Utah, assignors to The University of Utah, Salt Lake City, Utah

Filed Sept. 16, 1974, Ser. No. 506,464

Int. Cl.² G01N *27/30*, *27/46*, *31/14*, *33/16*

U.S. Cl. 204—195 B **10 Claims**

1. A hydrophobic membrane having one member of an immunochemically reactive pair immobilized thereon comprising:

a. a hydrophobic polymeric substrate swellable by an organic solvent,

b. hydrocarbon chains of at least 6 carbon atoms in length partially absorbed into the surface of said polymeric substrate, said hydrocarbon chains having a reactive site reactive with one compound of an immunochemically reactive pair attached to its non-absorbed portion, and

c. one member of an immunochemically reactive pair reacted with the reactive site of said hydrocarbon chain.

10. A quantitative device measuring electric potential difference for detecting presence of compounds reactive with an immobilized compound of an immunochemically reactive pair by utilization of an immunochemical reaction comprising:

a. a reference electrode;

b. a reactive electrode comprising:

1. an electrical metal conductor;

2. a sheath of hydrophobic polymeric membrane comprising:

a. a hydrophobic polymeric substrate swellable by an organic solvent,

b. hydrocarbon chains of at least 6 carbon atoms in length partially absorbed into the surface of said polymeric substrate, said hydrocarbon chains having a reactive site reactive with one compound of an immunochemically reactive pair attached to its non-absorbed portion,

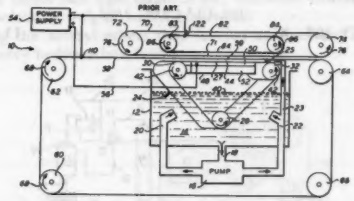
c. one member of an immunochemically reactive pair reacted with the reactive site of said hydrocarbon chain, and

c. electrical conductor means connecting said reference electrode and measuring electrode through a meter sensitive to very slight changes in electrical potential.

3,966,581
SELECTIVE PLATING APPARATUS

Paul C. Holte, Canton, Mass., assignor to Auric Corporation, Newark, N.J.

Filed Oct. 16, 1974, Ser. No. 515,319
Int. Cl.² C25D 17/28, 5/02, 5/06, 3/48
U.S. Cl. 204—202 9 Claims



1. Apparatus for continuous electroplating of selected portions of discrete electronic components of the type comprising an electrically conductive body terminating in a die-receiving face; a lip portion formed about said body above said face, said lip portion being of greater diameter than said face; and a plurality of electrical contacts formed as insulated islands at said die-receiving face, with flexible wire leads being connected to at least some of said contacts and extending oppositely from said die-receiving face beyond the body of said component, but said leads being electrically insulated from said body; said selected portions to be electroplated being said die-receiving face and said electrical contacts; and said apparatus comprising:

an electroplating station;

moveable applicator means adapted for carrying electroplating solution on a surface thereof;

means for continuously moving at least a portion of said applicator means surface through said electroplating station;

means for applying electroplating solution to said applicator means surface;

an electrically conductive conveyor belt means, having spaced openings therein for receiving said component bodies in nesting relationship, the periphery of said openings supporting said bodies at said lip portions so that said leads extend through said openings and said die-receiving faces project beyond the plane of said belt means;

lead contact means electrically continuous with said conveyor belt means, abounding each said opening, for surrounding the group of said leads extending from the component nested in said opening, and effecting a ring-like contact with said group, to provide electrical continuity between said leads and conveyor belt means;

said spaced openings of said conveyor belt being defined by formed out cups in said conveying belt, said cups being open at the bottom to define a rim portion electrically continuous with said conveyor belt means and of diameter less than the diameter of said openings, said rim portion being spaced from the periphery of said openings, said rim portion being spaced from the periphery of said openings on the side of said belt means opposite that supporting said lip portions, whereby said rim portion may surround and engage said extending group of wire leads to provide said ring-like contact with said group and thereby constitute said lead contact means;

means for maintaining said components in said nested positions in contact with said belt means and lead contact means; said means including a keeper belt, and means for bringing said keeper belt into contact with a portion of said component non-adjacent said conveying belt to sandwich said component;

a stationary conveyor belt guide means being mounted in fixed spaced relationship with respect to said moveable applicator means, and having a channel therethrough, through which said conveyor belt means passes, said guide means restraining the movement of said components other than in the direction of conveyance of said belt means, the said components being thereby conveyed across the surface of said applicator means with said projecting die-receiving face and said electrical contacts in contact with said electroplating solution on said applicator means;

means for moving said conveyor belt, keeper belt and sandwiched components together through said guide means at said electroplating station;

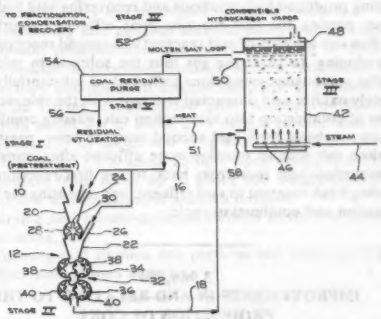
the direction of movement of said conveyed components through said guide means being such in relationship to said movement of said applicator means that the trace of each said component on the surface of said applicator means continuously overlies fresh electroplating solution; and

means for applying a D.C. electrical potential between said conveyor belt means, and electrically continuous component leads, and the side of said applicator means surface opposite said components, whereby to enable plating of said die-receiving faces and said contact present at said faces.

3,966,582
SOLUBILIZATION AND REACTION OF COAL AND LIKE CARBONACEOUS FEEDSTOCKS TO HYDROCARBONS AND APPARATUS THEREFOR

Frank B. Cramer, Misson Hills, Calif., assignor to Clean Energy Corporation, Los Angeles, Calif.

Filed Oct. 7, 1974, Ser. No. 512,538
Int. Cl.² C10G 1/06
U.S. Cl. 208—8 38 Claims

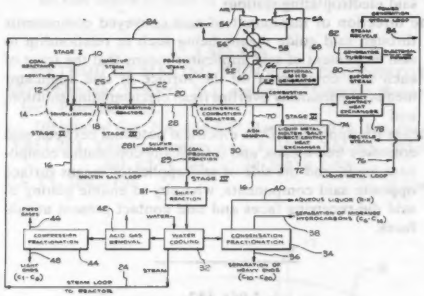


1. Process for the generation and recovery of low molecular weight hydrocarbons from high molecular weight carbonaceous feedstock, which includes forming a solution of said feedstock in molten inorganic salt, dissolving steam in said solution to form a homogeneous reaction stream containing active nonmolecular hydrogen, passing said reaction stream through a reaction zone under conditions and in a manner briefly contacting said feedstock with said hydrogen under hydrogenating conditions including a stream temperature between 250° and 600° C, to produce low molecular weight hydrocarbon vapors dispersed undissolved through said reaction stream, and collecting and recovering said vapors differentially by stripping higher molecular weight vapors from the molten salt of the reaction stream with lower molecular weight vapors.

3,966,583
COAL TREATMENT PROCESS AND APPARATUS

Frank B. Cramer, Mission Hills, Calif., assignor to Clean Energy Corporation, Los Angeles, Calif.

Filed Oct. 7, 1974, Ser. No. 512,539
Int. Cl.² C10G 1/06
U.S. Cl. 208—8 41 Claims



13. Process for the treatment of coal or like carbonaceous solid fuel reactant for the coproduction of hydrocarbons and heat energy, which includes introducing a single phase molten salt solution of said reactant into a first reaction zone, generating active hydrogen by steam dissociation within said zone, contacting said reactant with said active hydrogen within said first zone and under hydrogenating conditions sufficient to hydrogenate the relatively more reactive 50 to 85% by weight portion of said reactant, separating overhead a stream comprising produced hydrocarbons and recovering said hydrocarbons; passing the first reaction zone effluent comprising a molten salt solution of said reactant to a second reaction zone, introducing an oxidizing gas into the solution in said zone under combustion conditions sufficient to substantially completely oxidize said unreacted reactant with the release of the heat of combustion into said molten salt, passing combustion gases overhead from said second reaction zone, passing the molten salt second reaction zone effluent after transferring combustion heat therefrom back to the first reaction zone, adding fresh reactant to said effluent, and repeating the hydrogenation and combustion cycle.

3,966,584
IMPROVEMENTS IN AND RELATING TO THE PRODUCTION OF COKE

Michael David Gray, and Geoffrey Michael Kimber, both of Cheltenham, England, assignors to Coal Industry (Patents) Limited, London, England

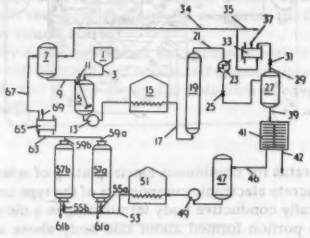
Filed Nov. 22, 1974, Ser. No. 526,251
Claims priority, application United Kingdom, Dec. 12, 1973, 57608/73
Int. Cl.² C10G 1/04
U.S. Cl. 208—8 9 Claims

1. A process for the production of coke which process comprises digesting coal at an elevated temperature with a solvent which includes non-recirculated solvent, filtering undissolved material from the extract, concentrating the extract and thereafter coking the concentrated extract while recovering the solvent for recirculation, characterized in that prior to use in the digestion of the coal, said non-recirculated solvent is subjected to coking under conditions comparable with the conditions under which the coal solution is subjected to coking until the coking of all the cokable components in the solvent under those conditions is substantially complete.

3,966,585
MANUFACTURE OF COKE FROM A COAL EXTRACT

Michael David Gray; Geoffrey Michael Kimber, and David Ernest Shipley, all of Cheltenham, England, assignors to Coal Industry (Patents) Limited, London, England

Filed Nov. 26, 1974, Ser. No. 527,258
Claims priority, application United Kingdom, Nov. 30, 1973, 55654/73
Int. Cl.² C10G 1/04
U.S. Cl. 208—8 11 Claims

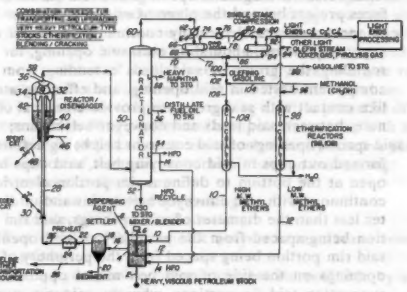


1. A process for the production of coke having a low mineral matter content which process comprises digesting coal in a non-hydrogenated high boiling aromatic oil solvent at a temperature within the range of 350°C. to 480°C. in an atmosphere which is substantially free from hydrogen separating insoluble matter from the coal digest to give a coal extract and coking the coal extract characterised in that all the coal prior to digestion has a volatile matter content within the range of 13% to 28% by weight.

3,966,586
METHOD FOR UPGRADING HEAVY PETROLEUM TYPE STOCKS

Hartley Owen, Belle Mead, and Paul B. Venuto, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed July 31, 1974, Ser. No. 493,445
Int. Cl.² C10G 11/04, 37/06; B01J 8/24, 29/28
U.S. Cl. 208—120 10 Claims



1. A method for upgrading heavy hydrocarbon feeds which comprises,

combining the heavy hydrocarbon feed with one or more lower boiling components selected from the group comprising low and high molecular weight methyl ethers, and a heavy cycle oil product of the operation,

converting the heavy hydrocarbon feed combined with said lower boiling component by contact with a crystalline zeolite containing conversion catalyst at a temperature within the range of 800°F. to about 1100°F.,

separating catalyst from the products of said conversion operation,

separating the products of said conversion operation into heavy fuel or recycle oil, light cycle oil, heavy naphtha, a light gasoline product and a gaseous product comprising C_4 and lighter olefins,

converting light olefin product of the process admixed with methanol to a low molecular weight methyl ether,

converting a portion of the gasoline product admixed with an olefin rich light naphtha and methanol to form high molecular weight methyl ethers and

using the methyl ethers thus formed as a solvent for the heavy hydrocarbon feed to be processed.

3,966,587

METHOD FOR CONTROLLING REGENERATOR TEMPERATURE IN A FLUIDIZED CRACKING PROCESS

Joel S. Bittensky, Port Arthur; Edward W. Dillingham, Neederland; William R. Menzies, III, Houston, and Roy E. Pratt, Groves, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,408
Int. Cl.² C10G *13/18*
U.S. Cl. 208—164 **8 Claims**

1. In a continuous fluidized catalytic cracking process wherein hydrocarbon charge stock is contacted with regenerated catalyst under cracking conditions in a riser transport reaction zone, wherein catalyst and hydrocarbon discharge from said riser into a reaction vessel for separation into a hydrocarbon vapor phase and a fluidized dense phase of coke-contaminated spent catalyst, wherein volatile hydrocarbon is stripped from said spent catalyst in a stripping zone, wherein spent catalyst from said stripping zone is transferred to a regeneration zone, comprising a fluidized dense catalyst phase maintained at a controlled temperature in the range of from about 1050°F. to about 1450°F. in the lower portion of said regeneration zone, and a dilute catalyst phase in the upper portion of said regeneration zone, wherein said coke-contaminated spent catalyst is contacted with an oxygen-containing regeneration gas for a controlled residence time in said fluidized dense catalyst phase for combustion of coke from said catalyst and production of a flue gas, and wherein the coke content of the spent catalyst is insufficient for providing heat required to maintain the regeneration zone fluidized dense catalyst phase at said controlled temperature; the improvement which comprises:

a. intimately mixing torch oil with said coke-contaminated spent catalyst being transferred from said stripping zone to said regeneration zone in an amount to provide sufficient combustible material in said regeneration zone to maintain the fluidized dense catalyst phase at a regeneration zone controlled temperature in the range of about 1275°F to about 1450°F while avoiding localized temperatures in said fluidized dense catalyst phase that are substantially higher than said controlled fluidized dense catalyst phase temperature;

b. adjusting the flow rate of said oxygen-containing regeneration gas to provide oxygen to effect substantially complete combustion of coke and torch oil to carbon dioxide and to provide in the range of from about 1 to about 10 mol% oxygen in the flue gas; and

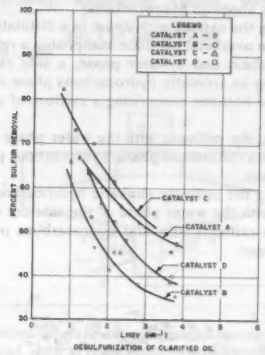
c. maintaining catalyst in the regeneration zone fluidized dense catalyst phase for a residence time in the range of from about 3 minutes to about 10 minutes for maintaining the temperature of said regeneration zone dilute catalyst phase below about 1500°F., maintaining the carbon monoxide concentration of the regeneration flue gas in the range of from about 0 to about 500 ppm, and maintaining the carbon-on-regenerated-catalyst content in the range of from about 0 to about 0.15 wt.%.

3,966,588

CATALYTIC HYDRODESULFURIZATION

William Ralph Beaty, Jr., Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 360,274, May 14, 1973, Pat. No. 3,900,430. This application Jan. 14, 1975, Ser. No. 540,915
Int. Cl.² C10G *23/02*
U.S. Cl. 208—216 **3 Claims**



1. A process for hydrodesulfurizing hydrocarbon oil by contacting said oil in the presence of hydrogen under hydrodesulfurization conditions with a catalyst consisting essentially of from about 0.5 to about 25 weight percent based on the catalyst weight of at least one catalytic metal selected from the group consisting of molybdenum, tungsten, chromium, nickel and cobalt supported on gamma alumina produced by a process consisting essentially of:

a. hydrolyzing aluminum alkoxides to produce an aqueous alumina slurry and an organic reaction product,

b. contacting said aqueous alumina slurry with an organic solvent selected from the group consisting of ethanol, propanol, isopropanol, butanol, hexanol, isobutanol and tertiary butanol in an amount sufficient to produce alumina having a cumulative pore volume (0–10,000A) from about 1.0 to about 2.75 cc/g, a surface area from about 225 to about 400 m^2/g and a loose bulk density from about 7.5 to about 25 lb/ft^3 upon drying to an Al_2O_3 content from about 80 to about 100 weight percent to form a solvent-aqueous alumina mixture,

c. drying said solvent-aqueous alumina mixture to produce alumina, and

d. forming said alumina into particles and calcining to produce said gamma alumina.

3,966,589

PROCESS FOR THE SEPARATION OF AROMATIC HYDROCARBONS FROM A MIXED HYDROCARBON FEEDSTOCK

George Solomon Somekh, New Rochelle, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 439,709, Feb. 5, 1974. This application Mar. 17, 1975, Ser. No. 559,077
Int. Cl.² C10G *21/28*
U.S. Cl. 208—321 **13 Claims**

1. A continuous solvent extraction-steam distillation process for the recovery of aromatic hydrocarbons having boiling points in the range of about 80°C. to about 175°C. from a feedstock containing aliphatic hydrocarbons and said aromatic hydrocarbons comprising the following steps:

a. introducing the feedstock into an extraction zone at about the midpoint thereof;

b. introducing a mixture of water and solvent into the extraction zone at about the top of said extraction zone, said

solvent being a water-miscible organic liquid having a boiling point of at least about 200°C.

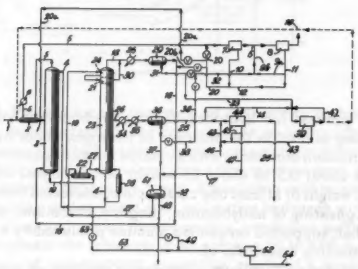
c. introducing reflux hydrocarbons into the extraction zone at about the bottom thereof;

d. contacting the feedstock in the extraction zone with the mixture of water and a solvent, the water phase of step (j), and the reflux hydrocarbons to provide an extract comprising aromatic hydrocarbons, reflux aliphatic hydrocarbons, solvent, and water and a raffinate comprising essentially aliphatic hydrocarbons;

e. contacting the extract with steam in a distillation zone to provide an overhead distillate comprising a reflux hydrocarbons phase and a water phase, a side cut distillate comprising an aromatic hydrocarbons phase and a water phase, and bottoms comprising a mixture of solvent and water;

f. contacting the raffinate with the water phase of step (g) to provide a raffinate aliphatic hydrocarbons phase and a water phase;

g. contacting the raffinate aliphatic hydrocarbons phase of step (f) with the water phase of the side cut distillate to provide a raffinate aliphatic hydrocarbons phase and a water phase;



h. contacting the water phase of the overhead distillate with an aromatic hydrocarbons stream containing at least 95 percent aromatic hydrocarbons, the amount of said stream being in the range of about 0.1 percent to about 5 percent by weight of the total aromatic hydrocarbons in the feedstock, to form an aromatic hydrocarbons phase and a water phase;

i. contacting the aromatic hydrocarbons phase of the side-cut distillate with the water phase of (h) to form an aromatic hydrocarbons phase and a water phase;

j. recycling the water phase of step (f) to the extraction zone at about the midpoint thereof;

k. recycling the water phase of step (i) to the distillation zone where said water phase is essentially converted to steam;

l. recycling the reflux hydrocarbons phase of the overhead distillate and the bottoms of step (e) to the extraction zone to provide, respectively, reflux hydrocarbons for step (c) and mixture of water and solvent for step (b); and

m. recovering the aromatic hydrocarbons phase of step (i) and the raffinate aliphatic hydrocarbons phase of step (g).

3,966,590

MAGNETIC ORE SEPARATOR

Roger W. Boom; Yehia M. Eyssa, both of Madison, Wis., and John Sutton, South Holmwood near Dorking, England, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Sept. 20, 1974, Ser. No. 508,013
Int. Cl.² B03C 1/30
U.S. Cl. 209—39 **5 Claims**

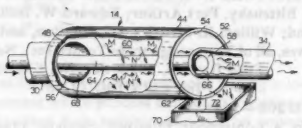
1. A method for separating magnetic components from material containing a mixture of magnetic and nonmagnetic components wherein said components are comminuted and slurried by mixing with a fluid, comprising

activating a radially directed magnetic field from a stationary magnetic flux source thereof which is extended distributed longitudinally from an initial point to a terminal point,

directing said slurry in a turbulent flow thereof from said initial point toward said terminal point and about said source as a center, and substantially perpendicular to the radial direction of said magnetic field, in an environment where said components of the mixture are subject to forces acting in a direction opposite to that of magnetic attraction on said magnetic components of said slurry mixture,

maintaining said magnetic field at a strength which overcomes said oppositely directed forces as said forces bear on said magnetic components, and draws said magnetic components toward said source,

maintaining said turbulent flow at an intensity which at substantially all points in said flow of slurry between said



initial and terminal points counteracts said forces drawing said magnetic components, including said magnetic attraction thereon tending to retain said magnetic components at said source, and modifies said forces on said nonmagnetic components, including said oppositely directed forces thereon, tending to dispel said nonmagnetic components away from said source, whereby said magnetic and nonmagnetic components are continuously maintained free-flowing in said flow between said initial and terminal points and carried across said magnetic field toward said terminal point, and concurrently separated one from the other into fractions taking disparate paths through said turbulent flow by said attraction of said magnetic components toward said centered source of magnetic flux and by said dispersion of said nonmagnetic components away from said centered source in response to said oppositely directed forces thereon, and

collecting separately said magnetic and nonmagnetic components at respective stations which are differently disposed therefor within extensions of said disparate paths beyond said terminal points.

3,966,591

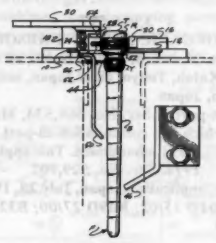
FILLING BOBBIN INSPECTION DEVICE

Charles V. Hinton; Kenneth W. Troutman, and Richard Ferguson, all of Charlotte, N.C., assignors to The Terrell Machine Company, Charlotte, N.C.

Filed May 23, 1975, Ser. No. 580,423
Int. Cl.² B07C 1/10
U.S. Cl. 209—73 **11 Claims**

1. A filling bobbin inspecting device for checking the completeness of a bobbin stripping operation comprising, in combination with means for feeding a series of spent filling bobbins that have been subjected to stripping action along a given path while suspended from the butts thereof, an elongated magnet means aligned at one side of said given path for receiving said bobbins serially and maintaining the suspension thereof through attraction at the butt rings while feeding travel continues, and feeler means extending laterally and angularly into said given feeding path at a normally biased position from which it is pivotally displaceable in the plane of the longitudinal axis of each suspended bobbin that is completely stripped to allow continuing travel of such bobbins

along said magnet means, but at which position said feeler means is held by a remaining bunch on any incompletely



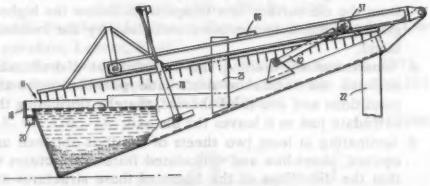
stripped bobbin and thereby caused to act as a stationary cam for forcing such bobbins to be dropped from said series.

3,966,592

DEWATERING AND CLASSIFYING APPARATUS

Daniel H. Herbert, 138 Ainsworth Ave., East Brunswick, N.J. 08816

Filed Mar. 20, 1975, Ser. No. 560,560
Int. Cl.² B03B 5/50
U.S. Cl. 209—462 **12 Claims**



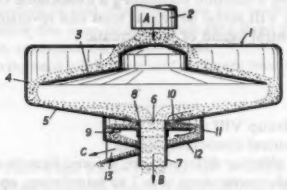
1. Apparatus for dewatering sand and like particulate material comprising well means for containing sand and water, sloped surface discharge means for conveyance of the particulate material upwardly thereof, the sloped discharge means having a lower end in said well means and an upper end disposed above said well means, rake means for discharging particulate material out of said well means up said sloped discharge means, said rake means including a moveable elongate structure having a plurality of rake blades projecting downwardly therefrom mounting means mounting said moveable elongate structure of said rake means for movement of said blades along said sloped surface discharge means in a discharging direction, and for return of said elongate structure and blades carried thereby away from said sloped discharge means and elevated relative thereto removing said elongate structure and blades carried thereby from said sand and water, and including cylinder drive means for said moveable elongate structure of said rake means, said drive means including first cylinder means operable in a direction generally parallel to said sloped discharge means for driving said rake means in a particle discharge direction alternately upwardly and downwardly along and generally parallel to said sloped discharge means, and second cylinder means operable in a direction generally transverse to said sloped discharge means for driving a lower end of said rake means alternately toward and away from an associated end of said sloped discharge means.

3,966,593

PROCESS AND AN APPARATUS FOR PURIFYING A STREAM OF MECHANICALLY COMMINUTED MATERIAL AS WELL AS FOR ENRICHING FINE ORES AND OTHER MINERALS BY MECHANICAL SORTING

John Larsson, Bromma, Sweden, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Mar. 10, 1975, Ser. No. 556,941
Claims priority, application Austria, Mar. 12, 1974, 2027/74
Int. Cl.² B07B 13/08
U.S. Cl. 209—479 **4 Claims**



1. In a process for purifying a stream of mecanically comminuted material, such as chips from wood cutting and sawdust, as well as for enriching fine ores and other minerals by mechanical sorting, in which a stream of material is subjected to shaking and is thereby thickened, whereupon, due to gravity, a lower layer of the stream of material forms, which is rich in heavier and smaller particles, while an upper layer of the stream of material, which contains lighter and bigger particles, forms thereabove, and in which said upper layer is separated by a mechanically acting separating means, the improvement comprising the step of deflecting said lower layer of the stream of material in a winding manner immediately after separation of said upper layer so as to controllably brake the speed of said lower layer material stream after separation.

3,966,594

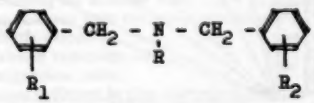
TREATMENT OF AQUEOUS WASTE SOLUTION

Masaaki Ohkawa, Takatsuki, and Yasuyoshi Sawaguri, Toyonaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Nov. 25, 1974, Ser. No. 527,151
Claims priority, application Japan, Nov. 26, 1973, 48-133181; Mar. 14, 1974, 49-29730
Int. Cl.² B01D 11/04
U.S. Cl. 210—22 R **16 Claims**

1. A process for treatment of organic waste water containing water-soluble organic anionic substances, which comprises

1. contacting an acidic waste water with a waterinsoluble organic solvent solution of at least one amine represented by the formula,



wherein R_1 and R_2 are each a hydrogen or halogen atom or a C_1 – C_4 alkyl group, and R is a C_8 – C_{18} alkyl or alkenyl group,

whereby said substances are transferred to said organic solution,

2. separating the aqueous layer from the organic layer, and
3. contacting said organic layer with an aqueous alkali solution whereby said substances are transferred to said

aqueous alkali layer and said amine is recovered as the organic solution thereof.

3,966,595

METHOD OF MAKING GROUP VIII METAL COMPLEX COMPOUNDS

Lawrence W. Gosser, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 273,804, July 20, 1972, abandoned. This application May 10, 1974, Ser. No. 468,691

Int. Cl.[2] B01D *13/00*

U.S. Cl. 260—429 R **11 Claims**

1. A method of making ligand deficient Group VIII metal complex compounds which comprises:

contacting a solution containing a dissociable complex of a Group VIII metal having at least one reversibly dissociable neutral ligand of the formula:

$$L_xMY_z$$

wherein

M is a Group VIII metal,

L is a neutral dissociable ligand,

the Y's, alike or different, are anionic ligands or noncoordinated counter-ions, x is 3 to 6 inclusive, and z is 0 to 3 inclusive with an asymmetric semipermeable membrane consisting essentially of an aromatic polymer having recurring

groups in the polymer chain, said membrane being permeable to said dissociated ligand, and applying to the solution pressure greater than the osmotic pressure of said solution whereby dissociated ligand is separated from said solution.

3,966,596

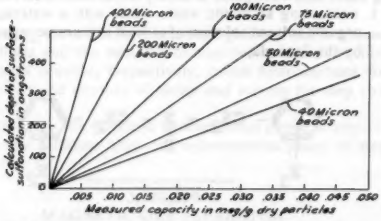
HIGH PERFORMANCE, CATION-EXCHANGE CHROMATOGRAPHY ON SURFACE-SULFONATED COMPOSITIONS

Timothy S. Stevens, and Hamish Small, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 386,261, Aug. 6, 1973, Pat. No. 3,925,019. This application Mar. 10, 1975, Ser. No. 556,761

Int. Cl.[2] B01D *15/08*

U.S. Cl. 210—24 **10 Claims**



1. A process for chromatographic separation of cations comprising:

a. passing a fluid mixture comprising the cations through a bed comprising synthetic resin particles of about 5 microns to about 200 microns particle size, said synthetic resin particles being cross-linked to from about 0.25 percent to about 5 percent and surface-sulfonated to a calculated depth of about 100 Angstroms to about 300 Angstroms; and

b. eluting the bed with an eluent which differentially removes cations which are attracted to surface-sulfonation sites on the synthetic resin particles.

3,966,597

OIL OR ORGANIC SOLVENT-ABSORBENT

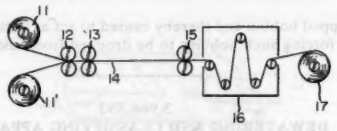
Akira Omori; Isao Okamura; Tadasi Imoto, all of Sagamihara, and Takayuki Katoh, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 360,534, May 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 136,511, April 22, 1971, abandoned. This application Dec. 5, 1974, Ser. No. 529,907

Claims priority, application Japan, July 28, 1970, 45-65893

Int. Cl.[2] B01D *15/02*; **B29D** *27/00*; **B32B** *31/14*

U.S. Cl. 210—39 **27 Claims**



1. A process for the preparation of an oil or organic solvent-absorbent, which comprises:

a. extruding a molten mixture of a resinous blend consisting essentially of 60 to 99 parts by weight of polystyrene and 1 to 40 parts by weight of polyethylene and a foaming agent through a die with a slit clearance of 0.1 – 1.0 mm;

b. quenching the extrudate at a point less than 5 mm away from the die surface to a temperature below the highest glass transition temperature exhibited by the resinous blend;

c. simultaneously drafting the extrudate at a draft ratio between the maximum draft ratio possible under the conditions and one-third thereof, thereby fibrillating the extrudate just as it leaves the die exit;

d. laminating at least two sheets of the thus-obtained unopened, sheet-like and reticulated fibrous structures so that the directions of the fibers of these structures are identical to each other;

e. pulling the laminate in the direction perpendicular to the direction of the fibers to open the same; and

f. subjecting the opened, sheet-like laminate to heat shrinking treatment at a temperature ranging from 80° to 150°C. to develop crimps in the fibers.

13. The oil or organic solvent-absorbent produced by the process of claim 1.

14. A process for removing oil from the surface of a body of water comprising contacting said surface with an oil absorbent as defined by claim 13.

3,966,598

CIRCULAR DISSOLVED GAS FLOTATION SYSTEM

Gregory A. Ettelt, Berwyn, Ill., assignor to Tenco Hydro/Aerosciences, Inc., Countryside, Ill.

Filed Feb. 24, 1975, Ser. No. 552,650

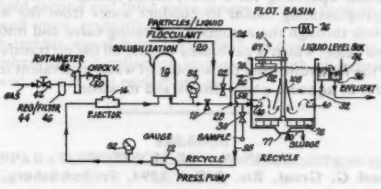
Int. Cl.[3] B03D *1/02*, *1/26*

U.S. Cl. 210—44 **19 Claims**

1. In a dissolved gas flotation system including means to inject gas into liquid and to dissolve the gas into the liquid, and having a flotation basin which receives a liquid having gaseous bubbles and particulates, wherein the improvement comprises: a submerged release chamber having a fixed fluid volume located generally about a major portion of the inner periphery of the flotation basin for reducing the velocity of the liquid discharged into the flotation basin, said release chamber

including inlet means to receive the liquid and outlet means to discharge the liquid into the flotation basin to permit upward flotation of the gaseous bubbles and particulates.

19. A dissolved gas flotation process comprising the steps of: introducing gas into recycled liquid; dissolving the gas in the liquid; forming gas bubbles in the liquid; combining water-carrying waste with the gas bubbles and recycled liquid; transporting the combined liquid-carrying particulates and gas bubbles into the entrance of an inlet to the flotation basin; reducing the entrance inlet velocity of the combined liquid-



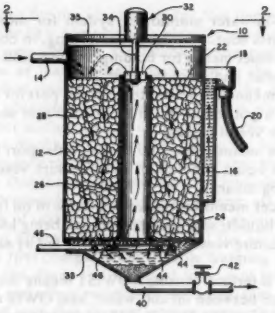
carrying particulates and gas bubbles; feeding the velocity-reduced liquid-carrying particulates and gas bubbles into a flotation basin via a submerged release chamber having a fixed fluid volume located generally about a major portion of the inner periphery of the flotation basin; providing upward flotation of the particulate-carrying gas bubbles; removing the flotable particulate from the flotation basin; removing clarified liquid from the flotation basin for effluent discharge; removing clarified liquid from the flotation basin for recycling; and pumping the recycled liquid to the gas introduction means.

3,966,599

METHOD AND APPARATUS

Carl E. Burkhead, Lawrence, Kans., assignor to Ecodyne Corporation, Lenexa, Kans.

Continuation-in-part of Ser. No. 202,489, Nov. 26, 1971, abandoned. This application Sept. 16, 1974, Ser. No. 506,211
Int. Cl.² C02C *1/04*
U.S. Cl. 210—14 **15 Claims**



1. A method for treating a liquor containing biodegradable waste products comprising:

introducing said liquor into a single column of submerged fixed media material said media providing a multiplicity of flow paths and having a surface area to volume ratio of at least 20 ft.² per cubic foot and a volumetric void space of at least 85%;

simultaneously surface aerating said liquor at the top of said media column and distributing the aerated liquor over the top of said media column to cause said liquor to flow downwardly through said media column and to be split into a multiplicity of individual streams to promote intimate contact of said liquor with said media and to control and maintain turbulence below a level disruptive to microbial growth on said media while providing sufficient oxygen for microbial growth on said media;

passing said liquor from the bottom of said column to a receiving basin positioned directly below said column;

returning said liquor from said receiving basin to the top of said media column through a flow passageway isolated from said column;

recirculating said liquor through said aerating and distributing steps to repeatedly pass said liquor through said media column;

removing effluent which has passed through said media column;

collecting residual solids in a sediment receiving zone in a lower portion of said receiving basin and spaced substantially below the flow path through said fixed media to a preclude resuspension of said solids;

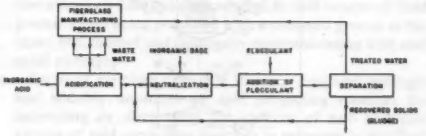
and removing said solids from said sediment receiving zone.

3,966,600

PROCESS FOR THE TREATMENT OF WASTE WATER FROM A FIBERGLASS MANUFACTURING PROCESS

Thomas N. Crowley, Myrtle Beach, S.C., and David M. Urbanski, Philadelphia, Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Filed Mar. 28, 1975, Ser. No. 563,029
Int. Cl.² C02B *1/20*
U.S. Cl. 210—46 **1 Claim**



1. A process for the treatment and recycling of waste water from a fiberglass manufacturing process contaminated with both water soluble and insoluble resins together with non resin particulate material, which comprises:

a. acidifying the waste water at a temperature from about 70° to about 200° F by the addition of an inorganic acid selected from the group consisting of sulfuric, carbonic and phosphoric acid in an amount sufficient to give acidified water having a pH of from about 3.5 to about 4.5;

b. neutralizing the acidified waste water by the addition of a base selected from the group consisting of:

i. calcium oxide;

ii. Calcium hydroxide; and

iii. magnesium oxide,

in an amount sufficient to give neutralized water having a pH of from about 7.5 to about 8.5, the acid of step a) and the base being selected so as to form a water insoluble inorganic salt.

c. adding an anionic polyelectrolyte flocculating agent to promote separation of solid material obtained from step c)

d. separating the solid material from the neutralized water, and adding a part of the solid material to the acidified water between steps a) and b); and

e. returning the neutralized water separated from the solid material to the fiberglass manufacturing process.

3,966,601
EFFLUENT TREATMENT

Arthur Stevenson, West Bromwich, and Neil Harkness, Lichfield, both of England, assignors to Robinson Brothers Ltd., West Bromwich, England

Filed Oct. 11, 1973, Ser. No. 405,476

Claims priority, application United Kingdom, Nov. 1, 1972, 50349/72

Int. Cl.² C02C *5/02*

U.S. Cl. 210—53 **15 Claims**

1. A process for purifying industrial effluent from a plant where dithiocarbamates are made or used and which contains at least 200 p.p.m. dissolved dithiocarbamate consisting essentially of, before discharging the effluent, adjusting the pH, if necessary to a pH of 6 to 8, mixing the effluent at a pH of 6 to 8 with an excess of up to 200% of the stoichiometric amount of at least one soluble heavy metal salt selected from the group consisting of iron and copper and thereby precipitating heavy metal dithiocarbamate, separating the precipitated heavy metal dithiocarbamate from the effluent, discharging the effluent and disposing of the said precipitate by dumping or incineration.

3,966,602
PROCESS AND APPARATUS FOR RECLAIMING AND REGENERATING SPENT SOLVENT

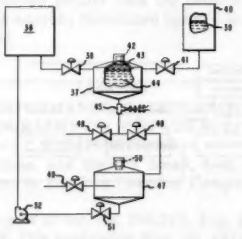
Charles Frederic Burger, Geneva, Switzerland, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 29, 1974, Ser. No. 501,790

Claims priority, application Switzerland, Sept. 17, 1973, 13300/73

Int. Cl.² B01D *17/02*, *21/10*

U.S. Cl. 210—83 **5 Claims**



1. Apparatus for reclaiming and regenerating spent solvent which is made up of a major portion of an oil phase and a minor portion of an aqueous phase and which has been used in a cleaning operation, which apparatus comprises:

1. a first vessel to hold spent solvent for a period of time sufficient to permit the spent solvent to separate into an upper aqueous phase and a lower oil phase, said first vessel having a liquid entry port to receive spent solvent and a liquid discharge port to discharge the liquid contents of the vessel;
2. an automatic liquid phase detector-transmitter connected in liquid relationship with the liquid discharge from the first vessel to generate an appropriate electrical signal indicating the presence or absence of the aqueous phase or the oil phase as either phase passes through the detector-transmitter, said detector-transmitter comprising an in-line electrical conductometric probe having two electrodes exposed to the liquid discharge stream from the first vessel;
3. a second vessel to hold the oil phase and having a liquid entry port to receive the oil phase; and
4. valve and conduit means, said valve means being controlled by a programming means which is actuatable by the electrical signal generated by the detector-transmitter, to conduct liquid from the liquid discharge port of the first vessel through the automatic liquid phase detector-transmitter and to direct the flow of oil phase into the liquid entry port of the second vessel and the flow of aqueous phase to waste,

said apparatus further comprising means to regenerate the reclaimed oil phase, said means comprising a vessel containing fresh oil, an automatic valve and conduit means controlled by said programming means to conduct liquid from the fresh oil-containing vessel to the first vessel which is calibrated to hold a predetermined amount of solvent, a water reservoir, an automatic operating valve and conduit means controlled by said programming means to conduct water from the water reservoir through the automatic operating valve and into the second vessel which is calibrated to hold all the oil transferred from the first vessel and the amount of water equivalent to the amount of aqueous phase discharged to waste.

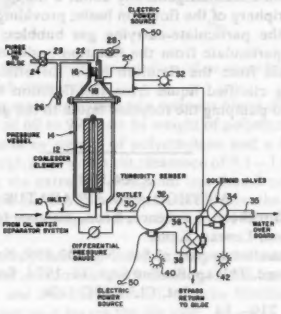
3,966,603
OIL-IN-WATER MONITOR

Michael G. Grant, Rte. 5 Box 1894, Fredericksburg, Va. 22401

Filed Nov. 25, 1975, Ser. No. 635,492

Int. Cl.² B01D *35/00*

U.S. Cl. 210—86 **12 Claims**



1. An oil-in-water monitoring system for monitoring the effluent from a source of liquid comprising, in combination:

pressure vessel means for holding a liquid, said means having an inlet and an outlet port;

inlet pipe means connected to said inlet port for transferring at least a portion of the effluent from said source to said pressure vessel means;

outlet pipe means connected to said outlet port for transferring the liquid contents of said pressure vessel means to receiving means;

oil coalescer means for coalescing drops of oil from oil-containing liquids, said coalescer means being located within said pressure vessel means and being fed by said inlet pipe means;

oil-water interface sensing (OWIS) means for sensing an interface between oil and water, said OWIS means being located near the top of said pressure vessel at a level which measures off a predetermined volume at the top, said volume being called the oil-collection section,

said OWIS means providing an output signal when said oil-collection section isfilled with oil;

purge line means connected to said oilcollection section for emptying the oil therefrom;

first valve means for controlling the flow of liquid through said purge line means, said valve means being normally closed;

first timing means for maintaining said first valve means closed for a predetermined first period of time and opening said first valve means for a sufficient time to empty said oil-collection section ;

second valve means for controlling the flow of liquid through said outlet pipe means, said second valve means being normally open;

by-pass pipe means connected to said outlet pipe means between said outlet port and said second valve means for by-passing the flow of liquid through said outlet pipe means to a receiver other than said receiving means; and

third valve means for controlling the flow of liquid through said by-pass pipe means, said third valve means being normally closed,

the output signal from said OWIS means bein transferred to said second and third valve means to cause them to close and open, respectively,

the output signal from said OWIS means occurring only when said oil-collection section fills with oil before the end of said first period of time.

3,966,604

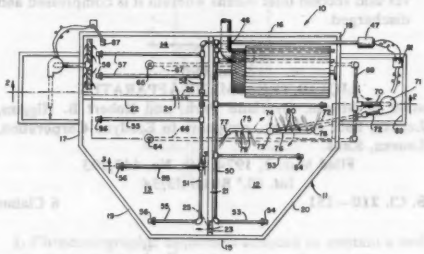
APPARATUS FOR AEROBIC DECOMPOSITION OF SEWAGE

Richard E. Diggs, 12 A Road, Carthage, Mo. 64836

Filed Mar. 25, 1975, Ser. No. 561,877

Int. Cl.² B01D *21/24*

U.S. Cl. 210—104 **15 Claims**



1. Apparatus for the aerobic, sludge free decomposition of sewage and the like, comprising: a plurality of separate, liquid-containing compartments; a rotatable, horizontally disposed, hollow drum at least partially immersed in the liquid contained in a first one of the compartments; the drum having sides with a plurality of holes defined therein which form an irregular inner surface on the drum sides, a raw sewage feed pipe having a discharge end located within the interior of the drum to introduce raw sewage and the like into the interior of the drum so that the sewage contacts the irregular inner surface of the drum sides to be agitated thereby; air inlet means at the bottom of said first compartment to indroduce air thereinto and thus effect upward bubbling of the air through the liquid in the first compartment; bubble trapping means connected with the drum and arranged to trap at least some of said bubbles and effect rotation of the drum, said drum rotating at a speed such that the raw sewage contacting the irregular inner surface of the drum sides is sufficiently agitated to be fragmented into particles small enough to pass through the holes in the drum wall and into the first compartment; the air inlet means being arranged in the first compartment to introduce bubbles thereinto in a direction so that at least some of the bubbles contact fragmented particles to agitate and aerate the fragmented particles flowing into that first compartment from the rotating drum to enhance aerobic decomposition thereof; and flow control means operatively associated with the compartments to effect the sequential flow of the material through all of the compartments and to effect recycling of the heavier particles thereof, until substantially complete liquification and decomposition of the material is obtained.

3,966,605

RESERVOIR

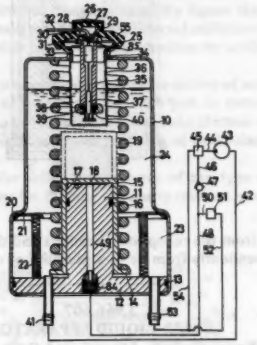
Hiromu Kuromitsu, and Naoki Ohara, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Toyota, Japan

Filed Jan. 22, 1975, Ser. No. 542,930

Claims priority, application Japan, Feb. 20, 1974, 49-020924

Int. Cl.² B01D *27/10;* **E03B** *11/00*

U.S. Cl. 210—130 **5 Claims**



1. A reservoir having an accumulator incorporated therein, said accumulator being fluidically connected to a source of fluid pressure, and comprising,

a casing;

a projecting member fixedly connected at one end to one end of said casing and projecting into said casing, said projecting member being provided with an axial passage therethrough fluidically connected to said source of fluid pressure and being provided with a recessed groove at the inner end thereof and fluidically communicating with said axial passage;

a cylindrical member closed at its inner end and sealingly and slidably mounted on said projecting member for increasing or decreasing the volume of said recessed groove of said projecting member in response to the fluid pressure from said source of fluid pressure;

a chamber for containing oil formed between the other end of said casing and said slidable cylindrical member; and

a spring member disposed within said chamber for constantly urging said cylindrical member against increases in volume of the recessed groove of said projecting member when subjected to fluid pressure, one end of said spring member being in contact with said other end of said casing and the other end thereof with said cylindrical member.

3,966,606

FILTER IN SAMPLE DRAWING DEVICE

Mohammad Ahmad, Ipswich, England, assignor to Fisons Limited, London, England

Filed Feb. 5, 1975, Ser. No. 547,334

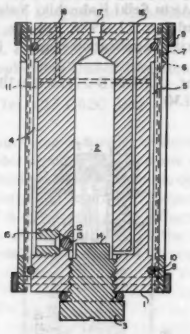
Claims priority, application United Kingdom, Feb. 6, 1974 5407/74

Int. Cl.² B01D *35/00*

U.S. Cl. 210—136 **8 Claims**

1. A filtration device comprising a housing containing a closed filtrate storage chamber, the external surfaces of the housing being provided with at least two open faced filtrate reception chambers, the open faces of said chambers being closed with a filtration medium; the storage chamber being connected to one of the reception chambers by means of a passage incorporating a one way valve; the reception chambers being in liquid flow connection with one another by

means of passages within the housing; the housing being provided with further passages whereby fluid may be fed to or



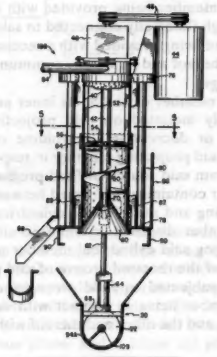
removed from the reception chambers and the storage chamber independently from or to a plurality of external sources.

3,966,607

SOLID-LIQUID SEPARATOR

William Wayne Gaynor, Atwood, and Gene Ray Voigt, Sterling, both of Colo., assignors to Ceres Ecology Corporation, Denver, Colo.

Filed Jan. 22, 1975, Ser. No. 542,969
Int. Cl.² B01D *21/04*; B30B *9/12*, *15/00*
U.S. Cl. 210—137 **7 Claims**



1. A separator for separating a viscous slurry of at least about fifteen percent solid content into solid and liquid fractions, the liquid fraction comprising a slurry of water and fine solids and the solid fraction comprising coarse fibers and grains, including

a housing comprising a substantially cylindrical screen having an upper zone and a lower zone, the screen having openings smaller than the fibers and grains comprising the solid fraction;

rotatably mounted axle means extending longitudinally through the upper and lower zones;

first inlet means communicating with said upper zone for feeding said slurry under pressure into said upper zone;

a plurality of scraper knives mounted to the axle means in said upper zone;

means for rotating said axle means;

the apertures in the screen in said upper zone comprising a first outlet means for most of said liquid fraction;

second inlet means communicating with the upper end of said lower zone for feeding said solid fraction and the remaining liquid fraction from said upper zone to said lower zone;

a substantially helical auger flighting mounted to the axle means in said lower zone;

second outlet means communicating with the lower end of said lower zone for discharging the contents of said lower zone, said second outlet means comprising a conically shaped member coaxial with said screen and movable axially during operation of the separator, with the small diameter end of said conical member extending into said lower zone;

means for applying a predetermined force to said conically shaped member to provide a back pressure to the contents of said lower zone; and

means enveloping at least a portion of said lower zone for accumulating said liquid fraction exiting from the upper and lower zones;

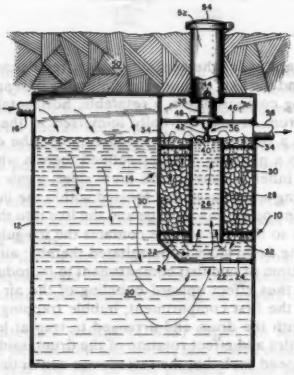
whereby upon feeding said viscous slurry into said housing upper portion through said first inlet means, the majority of the liquid fraction is separated from the remainder of said slurry, said liquid fraction exiting into said said accumulating means through said first outlet means, the remainder of said slurry entering said housing lower portion via said second inlet means wherein it is compressed and discharged.

3,966,608

LIQUID TREATMENT APPARATUS

Donald G. Mason, Overland Park, and Robert B. Higgins, Lenexa, both of Kans., assignors to Ecodyne Corporation, Lenexa, Kans.

Filed Mar. 1, 1974, Ser. No. 447,293
Int. Cl.² B01D *33/34*
U.S. Cl. 210—151 **6 Claims**



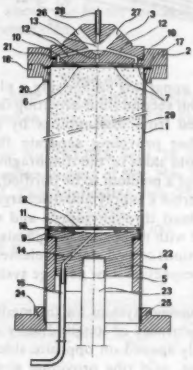
1. Improved apparatus for treating a liquor containing biodegradable wastes comprising: a settling tank having an inlet communicating with an upper portion thereof; a reactor chamber disposed within said settling tank, said reactor chamber having lower inlet means communicating with said settling tank, a perforated floor portion, and a vertical flow passageway; a column of fixed media within said reactor chamber on said perforated floor portion and surrounding said flow passageway, said media being composed of a multiplicity of elements freely and randomly stacked on one another to provide

interstitial areas therebetween, said elements having a high surface area to volume ratio; aeration means in said reactor chamber for introducing air into said liquor; means for delivering said liquor from said aeration means downwardly through said fixed media; means for recirculating said liquor through said fixed media and said central flow passageway; and means for withdrawing effluent from an upper portion of said reactor.

3,966,609
CHROMATOGRAPHIC DEVICE

Etienne Godbille, Villemomble, and Lucette Tondu, Bobigny, both of France, assignors to Roussel-UCLAF, Paris, France

Filed Feb. 25, 1974, Ser. No. 445,342
Claims priority, application France, Mar. 1, 1973, 73.07278
Int. Cl.² B01D *15/08*
U.S. Cl. 210—198 C **9 Claims**



1. Chromatographic apparatus adapted to contain a bed of particulate adsorbent material in column form, said apparatus comprising a tube; a lid removably mounted at one end of the tube, said lid being permeable to liquids and gases while retaining particulate adsorbent material; a slidable element movably mounted within said tube so as to provide a chamber of variable volume for particulate adsorbent material between said lid and said slidable element, said slidable element being permeable to gases and liquids while retaining particulate adsorbent material and movable the length of the tube; and means for communicating a force to said slidable element to displace said slidable element along the axis of the tube, said force being sufficient to compress particulate adsorbent material contained in said tube into the consistency of a solid body and said means being effective to maintain said particulate adsorbent material under compression and being capable of providing sufficient force to extrude all the solid body of adsorbent material from the end of the tube when the lid is removed.

3,966,610
FILTER

Orville J. Gibbs, North Easton, Mass., assignor to Bird Machine Company, Inc., South Walpole, Mass.

Filed Dec. 16, 1974, Ser. No. 533,338
Int. Cl.² B01D *33/02*
U.S. Cl. 210—203 **8 Claims**

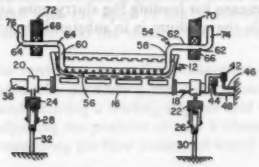
1. In a filter for solids-liquid slurry of the type which includes feed means for feeding the slurry into a plurality of individual pans containing a filter medium while the pans are in substantially horizontal position, suction means for removing liquid through said medium in said pans, cake treating means for applying treating liquid to a cake of solids formed on said medium in said pans, and moving means for relatively moving said pans and the aforesaid means to subject said pans successively to the action of said feed means and said suction means and of said treating means and said suction means;

the improvement for treating slurry containing solids particles of which a portion of relatively fine size settles more slowly in the slurry liquor under the force of gravity than the remainder, which comprises the combination of:

means operative upon feeding of slurry to each pan and prior to the action of said suction and cake treating means thereon to inhibit drainage of slurry liquor through said medium in said pan for a time interval sufficient to permit a cake of solids to form on said medium by settling in said liquor; and

removal means operative prior to the action of said suction and cake treating means on each pan to remove slurry liquor from above the so-formed cake therein while said liquor contains unsettled particles of said relatively fine size portion.

5. In a filter for solids-liquid slurry of the type which includes feed means for feeding the slurry onto an endless filter



medium while the medium is in substantially horizontal position, suction means for removing liquid through said medium, cake treating means for applying treating liquid to a cake of solids formed on said medium, and moving means from relatively moving said medium and the aforesaid means to subject said medium successively to the action of said feed means and said suction means and of said treating means and said suction means;

the improvement for treating slurry containing solids particles of which a portion of relatively fine size settles more slowly in the slurry liquor under the force of gravity than the remainder, which comprises the combination of:

means operative upon feeding of slurry to said medium and prior to the action of said suction and cake treating means thereon to inhibit drainage of slurry liquid through said medium for a time interval sufficient to permit a cake of solids to form on said medium by settling in said liquor; and

removal means operative prior to the action of said suction and cake treating means to remove slurry liquor from above the so-formed cake while said liquor contains unsettled particles of said relatively fine size portion.

3,966,611
FILTER

Orville J. Gibbs, North Easton, and John T. Roos, Westwood, both of Mass., assignors to Bird Machine Company, Inc., South Walpole, Mass.

Filed Dec. 16, 1974, Ser. No. 533,340
Int. Cl.² B01D *33/02*
U.S. Cl. 210—203 **13 Claims**

1. In a filter for solids-liquid slurry of the type which includes feed means for feeding the slurry into a plurality of individual pans containing a filter medium while the pans are in substantially horizontal position, suction means for removing liquid through said medium in said pans, cake treating means for applying treating liquid to a cake of solids formed on said medium in said pans, and moving means for relatively moving said pans and the aforesaid means to subject said pans

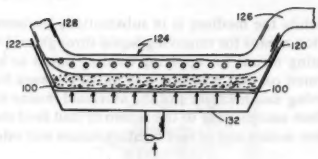
successively to the action of said feed means and said suction means and of said treating means and said suction means;

the improvement for treating slurry containing solids particles of which a portion of relatively fine size settles more slowly in the slurry liquor under the force of gravity than the remainder, which comprises the combination of:

means operative upon feeding of slurry to each pan and prior to the action of said suction and cake treating means thereon to inhibit drainage of slurry liquor through said medium in said pan for a time interval sufficient to permit a cake of solids to form on said medium by settling in said liquor, including backflushing means for supplying liquid to the under surface of said filter medium, while said cake is forming by settling in said liquor, at a pressure sufficiently above the hydrostatic head of slurry in said pan over said medium to cause said liquid to flow upwardly through said medium and cake forming thereon; and

removal means operative prior to the action of said suction and cake treating means on each pan to remove slurry liquor from above the so-formed cake therein while said liquor contains unsettled particles of said relatively fine size portion.

8. In a filter for solids-liquid slurry of the type which includes feed means for feeding the slurry onto an endless filter medium while the medium is in substantially horizontal posi-



tion, suction means for removing liquid through said medium, cake treating means for applying treating liquid to a cake of solids formed on said medium, and moving means for relatively moving said medium and the aforesaid means to subject said medium successively to the action of said feed means and said suction means and of said treating means and said suction means;

the improvement for treating slurry containing solids particles of which a portion of relatively fine size settles more slowly in the slurry liquor under the force of gravity than the remainder, which comprises the combination of:

means operative upon feeding of slurry to said medium and prior to the action of said suction and cake treating means to inhibit drainage of slurry liquor through said medium for a time interval sufficient to permit a cake of solids to form on said medium by settling in said liquor, including backflushing means for supplying liquid to the under surface of said filter medium, while said cake is forming by settling in said liquor, at a pressure sufficiently above the hydrostatic head of slurry over said medium to cause said liquid to flow upwardly through said medium and cake forming thereon; and

removal means operative prior to the action of said suction and cake treating means to remove slurry liquor from above the so-formed cake while said liquor contains unsettled particles of said relatively fine size portion.

3,966,612

DIALYSIS APPARATUS FOR PURIFICATION OF A MEDIUM, PREFERABLY BLOOD

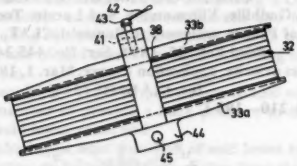
Paul-Johny Johansson, Bankgatan 14, S-223 52 Lund, Sweden

Filed Dec. 10, 1973, Ser. No. 423,393

Claims priority, application Sweden, Sept. 13, 1973, 7312461

Int. Cl.² B01D *31/00*

U.S. Cl. 210—238 **9 Claims**



1. In a dialysis apparatus embodying a plurality of stacked alternating first and second fluid-directing flow plate elements sealingly separated from one another by a semi-permeable diaphragm member providing separate fluid flow passage systems on opposite sides of the diaphragm member for passage respectively of a medium to be purified, and of a purification medium, wherein a supply and discharge of the respective mediums is obtained through supply and discharge conduit means connected with respectively separate hole and passage means in end portions of said stacked elements and communicating with said respective flow passage systems; the improvement comprising:

a. a first flow passage system for the medium to be purified including a plurality of longitudinally elongated parallel ribs uniformly spaced on opposite sides of the first flow plate element, said ribs providing straight, unimpeded, constant direction flow paths;

b. a second flow passage system for the purification medium including a plurality of series of longitudinally aligned parallel ribs on opposite sides of the second flow plate element, which plurality of series are arranged longitudinally in a side-by-side manner and laterally separated slightly by longitudinally directed flow passages, the ribs of each respective series being angled differently from those of each adjacent series effecting constantly changeable flow patterns of the purification medium flowing therethrough;

c. wherein the respective ribs of said first and second flow plate elements are of substantially the same height from a planar base portion thereof, and respective patterns of the ribs and rib series are the same in number and disposed so as to be substantially opposite one another when in interleaved assembly with the apparatus, thereby maintaining the interposed diaphragm member in positively gripped condition and substantially uniformly spaced from the planar base portions of said plate elements.

3,966,613

APPARATUS FOR SPILLING RETRIEVAL

William P. Kirk, 22 Glenhaven Circle, Saco, Maine 04072, and Dwight W. Reynolds, R.F.D. 1, Box 49, Pownal, Maine 04069

Filed Jan. 22, 1975, Ser. No. 543,170

Int. Cl.² E02B *15/04*

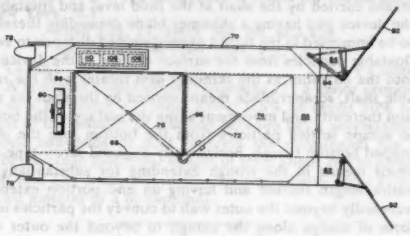
U.S. Cl. 210—242 **7 Claims**

1. Apparatus for retrieving a liquid spilling floating on water, comprising in combination,

a catamaran having spaced parallel hulls, and

bow and stern gates extending between the hulls and forming therewith a well, the walls of the well extending a substantial distance below the surface of the spilling, the

bottom of the well having an opening, each of the gates being supported by the hulls for independent pivotal



movement, the stern gate being mounted for movement to a position above the water line defined by the buoyancy of the catamaran.

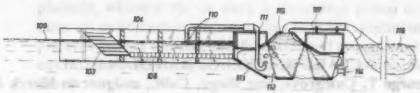
3,966,614
OIL SPILL CLEANUP SYSTEM

Ray R. Ayers, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 292,028, Sept. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 225,987, Feb. 14, 1972, abandoned. This application July 29, 1974, Ser. No. 492,556

Int. Cl.² E02B *15/04*

U.S. Cl. 210—242 R **14 Claims**



1. Apparatus for removing oil from the surface of a body of water comprising:

means adapted to support the apparatus in the water;

a compartment supported by the support means having an at least partially submerged open front end permitting entry of oil and water into the compartment, sides, a rear end, and an at least partially open submerged bottom permitting exit of water from the compartment;

baffles which divide the open front end of the compartment into separate adjacent chambers open at front and rear to permit passage of oil and water therethrough and of sufficient length to substantially arrest orbital water particle motion associated with waves without substantially impeding flow;

baffles which divide the open bottom into separate adjacent chambers open at bottom and top and of sufficient vertical extent to diffuse and downwardly direct water exiting from the compartment, whereby the diffusion and change of current direction in combination with the wave suppression action of the front baffles create a quiescent oil capture zone within the compartment; and

means for articulating at least the bottom baffles from front to rear to be wave conformable.

3,966,615
OIL COLLECTION BARGE

Sigvald L. Petchul, and Richard K. Petchul, both of 1380 SW. 57th Ave., Plantation, Fla. 33314

Filed June 25, 1974, Ser. No. 483,018

Int. Cl.² E02B *15/04*

U.S. Cl. 210—242 R **8 Claims**

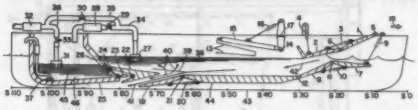
1. In a barge for collecting, containing and concentrating oil on the surface of water comprising:

a generally U-shaped longitudinally extending channel comprising two horizontally spaced, upstanding sidewalls with a bottom wall extending between them and adapted to receive water with oil on the surface thereof;

an entrance opening at the forward end of said channel through which water and oil may enter said channel for flow therethrough;

an upstanding wall at the rear end of said channel at which the oil on the surface of the water collects; and

a vent at the bottom wall of said channel forward of said rear wall for allowing water to flow out of said channel;



the improvement comprising:

an adjustable flow splitter consisting of a generally V-shaped member extending generally transversely across said channel with the apex of the V forming a trailing edge of said vent and the sides of the V extending rearwardly;

an adjustable vent plate extending transversely across said channel generally paralleling the apex of said V-shaped member and defining a leading edge of said vent;

means for adjusting the position of said V-shaped member, thereby controlling the flow pattern of water at said vent; and

means for adjusting the position of said vent plate. thereby controlling the size of said vent.

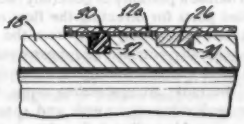
3,966,616
MEMBRANE CARTRIDGE

Donald T. Bray, Escondido, Calif., assignor to Desalination Systems, Inc., Escondido, Calif.

Filed Nov. 27, 1974, Ser. No. 527,686

Int. Cl.² B01D *31/00*

U.S. Cl. 210—433 M **4 Claims**



1. A membrane cartridge for reverse osmosis and ultrafiltration systems comprising a perforated central collection tube around which is spirally wound an assembly of at least one permeate transfer leaf, membrane leaf and brine side spacer leaf; an end area and side band areas of said permeate transfer leaf being attached by a sealing adhesive to adjacent surfaces of said perforated central collection tube; in which the improvement comprises:

a. a pair of circumferential grooves in said perforated central collection tube, each of said grooves being spaced apart from the other and within one of said side band areas of said permeate transfer leaf;

b. a resilient O-ring seated in each of said grooves in said perforated central collection tube; and

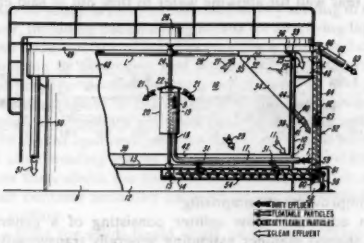
c. said sealing adhesive applied to said side band areas of said permeate transfer sheet and substantially filling the crevices between said resilient O-rings and said grooves in said collection tube and said permeate transfer leaf when said assembly of at least one permeate transfer leaf, membrane leaf and brine side spacer leaf is spirally wound around said perforated central collection tube.

3,966,617

SLUDGE ELEVATOR FOR FLUID CLARIFICATION SYSTEM

Fred A. Zaenkert, Cincinnati, Ohio, assignor to The Cincinnati Butchers' Supply Co., Cincinnati, Ohio

Filed Oct. 7, 1974, Ser. No. 512,495
Int. Cl.² B01D *21/14*
U.S. Cl. 210—519 **1 Claim**



1. A fluid clarification device for separating scum, sludge and clear fluid from a dirty effluent, comprising a cylindrical, separator tank having a flat bottom, a top, a rotatable shaft extending axially thereof for substantially the entire height of the tank, means on the tank top for rotating said shaft, an inlet pipe for dirty effluent extending upwardly into the tank from the bottom thereof and substantially coaxially therewith and having an effluent discharge opening upwardly presented for discharging dirty effluent axially within said tank in an upward direction, a cylindrical housing disposed coaxially around the inlet substantially at the center of the tank and having a cylindrical body, and a substantially circular splash plate having a shaft receiving opening centrally thereof receiving said rotatable shaft through said opening and located to be above said discharge opening and to extend radially outward from said shaft and in a downward direction so that the shaft receiving opening is above the outer circumferential edge of said splash plate, said discharge opening being offset from the central axis of said housing, said housing having a plurality of struts connecting said cylindrical body and said splash plate circumferential edge to define a plurality of generally radially and downwardly directed ports for directing the flow of dirty effluent impinging against said splash plate from the inlet discharge opening in a generally outward and downward direction into the tank at a level which is below the upper surface of liquid contained in the tank, an upstanding outer side wall and a vertical inner wall concentric with and spaced radially inwardly of the outer side wall to define therebetween a circumferential channel, the inner wall having a bottom edge spaced upwardly from the flat bottom a distance greater than the maximum depth of sludge which is accumulated on the bottom of the tank to define a fluid discharge port for discharging clean effluent from the separator tank, the discharge port being in open fluid communication with the circumferential channel for discharging clean effluent thereinto, said inner wall having an upper edge spaced above the upper edge of the outer wall to form a barrier for confining floatable particles within the tank, an annular trough secured to and surrounding an upper portion of the outer wall and in fluid communication with the circumferential channel for receiving clean effluent from the channel, an effluent collector connected to the annular trough for discharging effluent into a sewage disposal system, said trough having a lip on the outer circumferential edge thereof which lip is located above the fluid level to prevent spillage from the trough, an elongate chamber carried by and projecting inwardly from the inner wall and having an elongate mouth at the fluid level of fluid in the device and a conduit connected thereto for collecting matter from the chamber and transferring that matter away from the separator tank, said flat bottom having an elongate, radially extending, open-topped trough therein with the open top substantially coplanar with the flat bottom and in free, unobstructed, open communication with the bottom, an elongate, skimmer arm means carried by the shaft at the fluid level and rotatable in the device and having a skimmer blade depending therefrom to be immersed in the fluid a predetermined distance to sweep floatable particles from the surface of fluid in the device and into the chamber as the skimmer arm rotates with the rotatable shaft, scraper blade means carried by the shaft for rotation therewith and movement along the surface of the bottom to scrape settled particles from the bottom into the open-topped bottom trough, horizontally disposed screw-type conveyor means in the trough extending for substantially the entire length thereof and having an end portion extending outwardly beyond the outer wall to convey the particles in the form of sludge along the trough to beyond the outer wall, means for driving the horizontal conveyor means, a vertically extending conduit externally of the outer wall having a closed upper end and in fluid communication at a lower end portion thereof with the end of the conveyor means which extends beyond the outer wall and extending at its upper end upwardly a predetermined distance above the fluid level, and a vertically oriented screw-type conveyor means mounted in and carried by the vertically extending conduit for receiving sludge in said lower end portion thereof from said horizontal conveyor means and elevating the sludge to a discharge port at said closed upper end a predetermined distance above the fluid level to effect draining of the fluid from the sludge, whereby the discharged sludge is substantially free of excess fluid.

3,966,618

CLARIFICATION OF XANTHAN GUM

George T. Colegrove, San Diego, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 449,875, March 11, 1974. This application Oct. 10, 1974, Ser. No. 513,810
Int. Cl.² C12B *1/00*; E21B *43/22*
U.S. Cl. 252—8.55 D **1 Claim**

1. A solid composition comprising from about 85–95% by weight of solid xanthan gum containing cellular fermentation solids and about 5–15% by weight of an alkaline protease enzyme.

3,966,619

LUBRICANTS FOR COLD WORKING OF ALUMINIUM

Gordon Frederick Smith, Rugby, and Michael Keith Budd, Barford St. Michael, both of England, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed Oct. 28, 1975, Ser. No. 626,269
Claims priority, application United Kingdom, Nov. 5, 1974, 47694/74
Int. Cl.² C10M *1/44*, *3/38*, *5/24*, *7/24*
U.S. Cl. 252—32.5 **8 Claims**

1. A lubricant for working aluminium comprising essentially an aqueous solution of

a. a secondary alkylamine, in which at least one of the alkyl groups includes a chain of at least 8 carbon atoms, the secondary alkylamine including a carboxylic acid group as a substituent at a carbon atom not more than 3 atoms distant from the amino group and

b. an acid phosphate mono- or di-ester of a polyalkylene oxide surface active agent, said alkylamine and said acid phosphate ester each having a solubility of at least ⅛% by weight in water and said solution including at least ⅛% by weight of said alkylamine and said acid phosphate ester.

3,966,620
LUBRICANT COMPOSITIONS

Robert F. Bridger, Hopewell, and Albert L. Williams, Hopewell Township, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 11, 1975, Ser. No. 603,428
Int. Cl.² C10M *1/40, 3/34, 1/32, 3/26*
U.S. Cl. 252—33.4 **9 Claims**

1. A lubricant composition comprising (1) a major proportion of a lubricant, (2) from about 0.5% to about 30% by weight of the product of reaction between (a) a polyalkenylsuccinic anhydride or acid, wherein the polyalkenyl has a number average molecular weight of from about 200 to about 4,000 and (b) trishydroxymethylaminomethane and (3) an antirust amount of a bi-naphthol.

3,966,621
LUBRICATING OIL COMPOSITIONS

Robert Charles Watkins, Wantage; Derek Alfred Kinghan, and Robert Walter Humphrey, both of Didcot, all of England, assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed May 12, 1975, Ser. No. 576,969
Claims priority, application United Kingdom, May 17, 1974, 22087/74
Int. Cl.² C10M *1/54, 3/48, 5/28, 7/52*
U.S. Cl. 252—42.7 **17 Claims**

1. A process for the preparation of a colloidal suspension in oil of a Group II metal carbonate together with a Group II metal sulphurised phenate as dispersant in which
1. a reaction mixture is formed comprising
a. a Group II metal base compound,
b. either sulphur and one or more hydrocarbyl substituted phenols, wherein the or each hydrocarbyl group contains up to 60 carbon atoms or one or more sulphurised phenols having one or more hydrocarbyl group substituents, each substituent containing up to 60 carbon atoms,
c. a diol having a boiling point less than the decomposition temperature of the reaction product,
d. a C_1 to C_{18} monoalcohol or a C_2 to C_{30} ether alcohol and
e. oil
2. the reaction mixture is heated at a temperature of from 110° to 180°C in 5 to 15 hours, provided the rise in temperature from 150° to 160°C takes 1 to 4 hours, and that from 170° to 180°C takes 1 to 4 hours,
3. carbon dioxide is introduced into the reaction mixture when the temperature thereof is less than 140°C,
4. before the introduction of carbon dioxide has been completed the amount of water of reaction is reduced to below 0.3 wt.% based on the total weight of the reaction mixture, and thereafter
5. the diol and alcohol or ether alcohol are removed from the reaction mixture.

3,966,622
LUBE OIL DISPERSANT OF IMPROVED ODOR AND ANTIOXIDANT PROPERTIES

Walter W. Hellmuth, Beacon; Harry Chafetz, Poughkeepsie, and William P. Cullen, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 330,914, Feb. 9, 1973. This application Sept. 9, 1974, Ser. No. 504,616
Int. Cl.² C10M *1/48*
U.S. Cl. 252—46.6 **8 Claims**

1. A method of preparing a lubricating oil concentrate of a detergent-dispersant sulfurized alkoxylated product consisting essentially of:
a. first contacting a polyalkene of an average molecular weight between about 500 and 50,000 with P_2S_5 in the presence of between about 0.1 and 1 wt. % sulfur at a temperature between about 100 and 320°C., said P_2S_5 comprising between about 5 and 40 wt. % of the reaction mixture,
b. secondly diluting the polyalkene-P_2S_5 with mineral lubricating oil to form a lube concentrate of between about 10 and 90 wt. % of said lubricating oil,
c. thirdly contacting the polyalkene-P_2S_5 lube concentrate with steam at a temperature between about 100 and 260°C. utilizing at least about a mole ratio excess of steam in respect to said polyalkene-P_2S_5 reaction product,
d. fourthyl removing inorganic phosphorus acid from the steam treated polyalkene-P_2S_5 concentrate,
e. fifthly contacting the inorganic acid free, steam hydrolyzed polyalkene-P_2S_5 concentrate with an alkylene oxide of the formula:

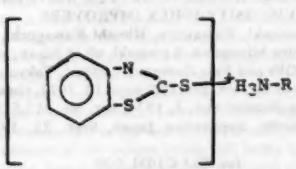
where R^1 and R^2 are hydrogen or an alkyl containing 1 to 6 carbon atoms in a mole ratio of said inorganic phosphorus acid free, steam hydrolyzed P_2S_5-polyalkene reaction product to said alkylene oxide of at least about 1:1,
the improvement which comprises the step of contacting the alkoxylated inorganic free, steam hydrolyzed polyalkene-P_2S_5 reaction product of Step *e* with added sulfur at a temperature between about 130° and 300°C. utilizing an initial polyalkene:added sulfur mole ratio of between about 1:0.5 and 1:10 to form said sulfurized alkoxylated product.

3,966,623
CORROSION INHIBITED LUBE OIL COMPOSITIONS

Robert H. Krug, Cornwall, and Clemence J. Henry, Newburgh, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed June 5, 1975, Ser. No. 584,243
Int. Cl.² C10M *1/38, 3/32, 5/28, 7/36*
U.S. Cl. 252—47 **6 Claims**

1. A composition comprising a major amount of hydrocarbon oil of lubricating viscosity and between about 0.01 and 25 wt. % of an amine salt of 2-mercaptobenzothiazole characterized by the formula:



where R is alkyl or alkenyl of between about 4 and 30 carbons and between about 0.01 and 25.0 wt. % of a thiadiazole characterized by the formula:

where R_1 and R_2 are alkyl or alkenyl of from 4 to 30 carbons.

3,966,624

BLENDED TRACTION FLUID CONTAINING HYDROGENATED POLYOLEFIN AND AN ADAMANTANE ETHER

Irl N. Duling, West Chester; David S. Gates, Swarthmore; Frederick P. Glazier, Thornton, all of Pa.; Robert E. Moore, Wilmington, Del., and Thomas D. Newingham, Broomall, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

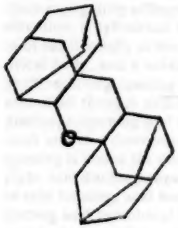
Filed July 15, 1971, Ser. No. 165,418
Int. Cl.² C10M *1/20*
U.S. Cl. 252—52 R 7 Claims

1. A composition useful as a base stock for a lubricant in a traction drive transmission, said composition having a kinematic viscosity at 210°F in the range of 1.5–200.0 cs. and comprising

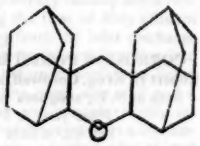
A. from 1–25 parts by weight of a hydrogenated polymer of C_3–C_8 aliphatic hydrocarbyl monoolefin, said polymer having an average molecular weight in the range of 180–2000, and

B. one part by weight of an adamantane compound selected from:

a. an ether having the formula



or



and

b. an alkyl-substituted derivative of said ethers.

3,966,625

LUBRICATING OIL COMPOSITION CONTAINING POLYOXYALKYLENE GLYCOL DIETHER VISCOSITY-INDEX IMPROVERS

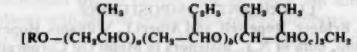
Yoshiharu Tanizaki, Kamakura; Hiroshi Kawaguchi, Tokyo, and Kenichiro Minagawa, Kawasaki, all of Japan, assignors to Nippon Oils and Fats Company Limited, Tokyo, Japan

Continuation of Ser. No. 290,272, Sept. 18, 1972, abandoned.
This application Oct. 3, 1974, Ser. No. 511,525
Claims priority, application Japan, Sept. 23, 1971, 46-74405
Int. Cl.² C10M *1/20*
U.S. Cl. 252—52 A 2 Claims

1. A lubricating oil composition consisting essentially of

a lubricating amount of a mineral oil and

a viscosity index improving amount of a polyoxyalkylene glycol diether of the formula:



wherein R is a hydrocarbon radical selected from the group consisting of C_nH_{2n+1}, C_nH_{2n-1}, C_nH_{2n-3} and C_nH_{2n-5},

n is an integer of 1–24 and

$$n \geq 6 - 5\frac{(b+c)}{a+b+c},$$

$a+b+c$ is an integer in the range of 5–100, and

a or $b+c$ may be 0 but a, b, and c are not 0 at the same time.

3,966,626

HEAT TRANSFER FLUIDS

Larry L. Jackson; Walter F. Seifert, and Daniel E. Collins, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 154,181, June 17, 1971, abandoned. This application Sept. 17, 1973, Ser. No. 398,049
The portion of the term of this patent subsequent to June 10, 1992, has been disclaimed.
Int. Cl.² C09K *5/00*
U.S. Cl. 252—73 2 Claims

1. A heat transfer fluid having a freezing point below about 40°F. and consisting essentially of at least about 20% by volume of diphenyl oxide and at least about 20% by volume of a polyphenyl ether having 3 or 4 phenyl rings.

3,966,627

DISHWASHING COMPOSITIONS

Frederick W. Gray, Summit, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 291,680, Sept. 25, 1972, abandoned.
This application Jan. 17, 1975, Ser. No. 541,813
The portion of the term of this patent subsequent to Aug. 28, 1990, has been disclaimed.
Int. Cl.² C11D *7/56*
U.S. Cl. 252—99 8 Claims

1. A water-soluble detergent composition capable of inhibiting overglaze attack consisting essentially of about 50-95% by weight of at least one water-soluble inorganic or organic builder salt and about 0.5–3.0% by weight of aluminum silicate, said aluminum silicate having a pH of about 5–9.

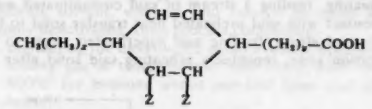
3,966,628

SOLID CLEANING COMPOSITIONS CONTAINING C_{21} DICARBOXYLIC ACID

Fred E. Woodward, West Palm Beach, Fla., assignor to Westvaco Corporation, New York, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,299
Int. Cl.² C11D *3/08*
U.S. Cl. 252—135 5 Claims

1. An alkaline dry mix and powdered formulation cleaning composition consisting essentially of an alkaline builder and from about 0.5% to about 15% by weight of a C_{21} dicarboxylic acid having the structure



wherein x and y are integers from 3 to 9, x and y together equal 12, wherein one Z is hydrogen (H), and the other Z is a carboxylic acid group (COOH), the acid being in anhydrous free acid form.

3,966,629
TEXTILE SOFTENING DETERGENT COMPOSITIONS

Richard John Dumbrell, Blyth, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 23, 1974, Ser. No. 500,096

Claims priority, application United Kingdom, Aug. 24, 1973, 40205/73; Aug. 31, 1973, 41085/73

Int. Cl.² C11D 3/12, 7/10

U.S. Cl. 252—140 **11 Claims**

1. Process for preparing a built laundry detergent composition comprising the step of spraying a moving bed of a particulate carrier selected from the group consisting of sodium and potassium tripolyphosphate, pyrophosphates, acid pyrophosphates, carbonates, sulfates, borates, and silicates and spray dried built synthetic detergent granules containing a hydratable, inorganic salt dried to such an extent that the salt is incompletely hydrated, said moving bed containing up to 50% by weight of a smectite-type clay softening agent having an ion exchange capacity of at least 50 meq/100 g, with a liquid agglomerating agent selected from the group consisting of aqueous solutions of electrolytes containing no more than 75% of saturation of said electrolytes and said electrolytes being selected from the group consisting of water soluble phosphates, tripolyphosphates, acid pyrophosphates, neutral pyrophosphates, carbonates, sulfates, chlorides, borates, silicates and mixtures thereof; water; and solutions of organic adhesives, said liquid agglomerating agent containing up to 60% by weight of said clay, the weight ratio of said agglomerating agent to the combined weight of said clay and said carrier being from 1% to 40%, to form free-flowing agglomerates.

3,966,630
USE OF POLYQUATERNARY AMMONIUM METHYLENE PHOSPHONATES IN CHELATING OR SCALE INHIBITION

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 237,883, March 24, 1972, Pat. No. 3,792,084. This application Nov. 5, 1973, Ser. No. 412,603

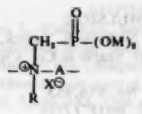
The portion of the term of this patent subsequent to Dec. 18, 1992, has been disclaimed.

Int. Cl.² C02B 5/06

U.S. Cl. 252—180 **10 Claims**

1. The process of chelating or inhibiting the formation of scale in an aqueous system which comprises treating said system with a polyquaternary ammonium methylene, or substituted methylene, phosphonate wherein all the methylene, or substituted methylene, phosphonate groups are nitrogen-bonded, wherein the substituted methylene moieties each consist of methylene substituted by at least one hydrocarbon group, wherein there are up to two such methylene, or substituted methylene, phosphonate groups bonded to a quaternary ammonium nitrogen atom and having at least one methylene, or substituted methylene, phosphonate group attached to at least one of such nitrogens, there being at least two quaternary ammonium groups in the polyquaternary ammonium moiety of the phosphonate.

3. The process of claim 1 where the polyquaternaries have repeating units of the general formula



where R is

or a hydrocarbon group, and A is a bridging group, M is hydrogen, ammonium, organic ammonium, or an alkali metal or an alkaline earth metal, and X is halogen, the bridging group A being an alkylene terminated bivalent hydrocarbon group having 8 to 30 carbons, or alkylene-ether containing group of the formula $A'-(OA')_n$ where A' is alkylene having 1 to 10 carbons and n is 1 to 10, or an alkylene group having 2 to 25 carbons unsubstituted or substituted by OH or halogen.

3,966,631
NEMATIC LIQUID CRYSTAL COMPOSITION

Kazuhisa Toriyama, Hitachi; Hidetoshi Abe, Katsuta; Fumio Nakano, Hitachi; Kenji Murao, Hitachi, and Mikio Sato, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 8, 1974, Ser. No. 495,768

Claims priority, application Japan, Aug. 15, 1973, 48-9089

Int. Cl.² G02F 1/16; C09K 3/34

U.S. Cl. 252—299 **7 Claims**

1. A nematic liquid crystal composition comprising:

a predominant amount of an N_a-type nematic liquid crystal;

an onium halide salt selected from the group consisting of quaternary ammonium halides, pyridinium halides, isoquinolinium halides, quniolinium halides, acrilidinium halides and combinations thereof, said onium halide salt being dissolved in the nematic liquid crystal for effecting a dynamic scattering mode of the liquid crystal compound upon application of a driving voltage; and

a phenolic compound selected from the group consisting of phenol, alkylphenols having a molecular weight of 108 to 290, benzoxyphenol, halogenated phenols having a molecular weight of 127 to 472, alkoxy substituted phenols having a molecular weight of 124 to 306, acyl substituted phenols having a molecular weight of 136 to 318, aminophenol, nitrophenols having a molecular weight of 139 to 185, methylaminophenol, cyanophenols having a molecular weight of 115 to 141, hydroquinone monobenzyl ether, p-phenylphenol and combinations thereof, said phenolic compound being dissolved in the nematic liquid crystal for improving solubility of the onium salt in the liquid crystal compound and for improving dissociation of the onium salt in the liquid crystal compound to ions;

the amount of the onium halide salt being 0.001 to 3% by weight, based on the weight of the liquid crystal composition, the phenolic compound being added to said composition in an amount of 0.5 to 50 times the amount of said onium halide salt, the amount of said phenolic compound in said composition being no larger than 6% by weight, based on the weight of the liquid crystal composition.

3,966,632

VEGETABLE OIL EMULSION

John A. Colliopoulos, Evanston, and Nicholas S. Yanick, Elmhurst, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed June 6, 1974, Ser. No. 476,953
Int. Cl.[2] A23D *3/00*, *5/00*; B01F *17/34*
U.S. Cl. 252—309 4 Claims

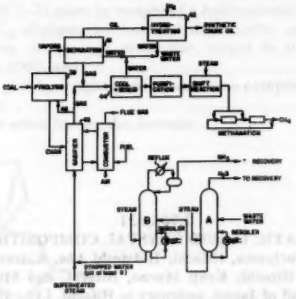
1. A water in oil emulsion comprising:
a. 91–98% soybean oil;
b. 1–5% water; and
c. 1–4% esters of a mixture of di-, tri-, and tetra-polyglycerols and 12-hydroxy-9-octadecenoic acid, said esters having a saponification value of 165–169.

3,966,633

WASTE WATER PROCESSING

Louis D. Friedman, New Brunswick, N.J., assignor to Cogas Development Company, Princeton, N.J.

Filed Sept. 23, 1974, Ser. No. 508,395
Int. Cl.[2] C07C *1/02*; C10J *3/12*
U.S. Cl. 252—373 2 Claims



1. In a system of synthesis gas manufacture including a gasifier wherein fluidized char is reacted with steam using a particulate heat exchange material to sustain the endothermic steam-carbon reaction to produce a synthesis gas stream which on cooling gives water contaminated with H_2S and NH_3 and a carbonizer wherein fluidized coal is carbonized below about 700°C to provide said char and vapors which on cooling give oil and water contaminated with H_2S and NH_3 and organic materials, the improvement which comprises steam-stripping the contaminated waters to remove the H_2S but retaining sufficient ammonia to keep the pH between about 8.5 to 10.5 and introducing the resulting treated water into the gasifier to provide at least a portion of the steam requirement therefor while consuming the organic materials.

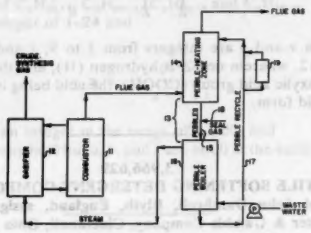
3,966,634

GASIFICATION METHOD

Martin E. Sacks, East Windsor, N.J., assignor to Cogas Development Company, Princeton, N.J.

Filed Sept. 23, 1974, Ser. No. 508,394
Int. Cl.[2] C07C *1/02*; C10J *3/12*
U.S. Cl. 252—373 1 Claim

1. a system of synthesis gas manufacture including a gasifier wherein fluidized char is reacted with steam using a particulate heat exchange material to sustain the endothermic steam-carbon reaction to produce a synthesis gas stream which on cooling gives water contaminated with H_2S and NH_3 and a carbonizer wherein fluidized coal is carbonized below about 700°C to provide said char and vapors which on cooling give oil and water contaminated with H_2S, NH_3 and organic materials, the improvement which comprises heating solid heat transfer material to a temperature above 500°C, then, after said heating, feeding a stream of said contaminated waters into contact with said preheated heat transfer solid to form superheated steam, feeding said superheated steam to said gasification zone, repeatedly reheating said solid after said



contact with said contaminated waters and repeatedly recycling the reheated solid into such contact with additional quantities of said contaminated waters, said solid being substantially inert in said process.

3,966,635

PROCESS FOR REACTIVATING PLATINUM CATALYSTS USED IN PRODUCTION OF HYDROXYLAMMONIUM SALTS

Hussain El-Ghatta, Chur, Grisson, and Johann Karl Forrer, Domat-Ems, Grisson, both of Switzerland, assignors to Inventa AG fur Forschung und Patentverwertung, Zurich, Switzerland

Filed Mar. 17, 1975, Ser. No. 558,703
Claims priority, application Switzerland, Mar. 21, 1974, 3906/74
Int. Cl.[2] B01J *23/42*; C01B *21/20*
U.S. Cl. 252—413 18 Claims

1. A process for rejuvenating an aged platinum catalyst which has been used for hydrogenation of nitric oxide to hydroxylammonium salts in an acid medium, which process comprises
a. treating the catalyst in the presence of a hydroxylammonium salt in a first stage with a sulfur compound in an aqueous acid medium, wherein said sulfur compound liberates sulfurous acid when subjected to said acid medium, said sulfurous acid being present in an amount of 1 to 150 atom % of sulfur based on the amount of platinum metal in said aged catalyst, said treatment being conducted substantially in the absence of oxidizing agents capable of oxidizing sulfurous acid to sulfate and for from 0.1 to 15 hours, thus obtaining a first-treated catalyst, and
b. treating the first-treated catalyst in a second stage with di- or tetravalent platinum compound in acid medium in the presence of hydrogen, said platinum compound being present in a platinum amount of 1 to 30% by weight based on the amount of platinum which the catalyst contained when used for the first time.

3,966,636

SEQUENTIAL HYDROGENATION-OXIDATION-HYDROGENATION OF RHODIUM AND RUTHENIUM CATALYSTS

John W. Jenkins, Seabrook; Ronald S. Bauer, and Harold E. De La Mare, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 19, 1974, Ser. No. 534,547
Int. Cl.[2] B01J *23/96*; C07D *301/00*
U.S. Cl. 252—419 4 Claims

1. A process for the regeneration of a catalyst comprising between about 0.1 and 10.0 percent weight rhodium or ruthenium on an alpha alumina carrier, said catalyst having been employed in the hydrogenation of a diglycidyl ether of 2–2

bis(4-hydroxyphenyl)propane in the presence of a methylene dichloride solvent, wherein said catalyst becomes at least partially deactivated, such process comprising:

a. contacting the deactivated catalyst with a hydrogen-containing gas at temperatures from about 400° to about 600°C for between about one-half hour and about 2 hours;

b. contacting the hydrogen-treated catalyst with an oxygen-containing gas which contains between about 1 and about 10 percent volume oxygen in a staging sequence, said staging sequence consisting of contacting the catalyst with the oxygen-containing gas at between about 75°C and about 125°C for between about one-third hour and two-thirds hour, then at between about 175°C and 225°C for between one-third hour and two-thirds hour, and then at between about 375°C and 450°C for between about 1 hour and about 1½ hours; and

c. contacting the oxidized catalyst with a hydrogen-containing gas at temperatures from about 150°C to about 600°C for between about one-half hour and about 1 hour.

3,966,637

CATALYSTS

Josef Witte, Cologne, and Günther Lehnert, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Nov. 12, 1974, Ser. No. 523,022

Claims priority, application Germany, Nov. 16, 1973, 2357193

Int. Cl.² C08F *4/78*

U.S. Cl. 252—429 B **7 Claims**

1. A catalyst composition comprising:

A. a reaction product of 1 mol tungsten hexachloride with from 1 to 4 mols of a mixture of 2-chloroethanol and 2,2,2-trichloroethanol in a molar ratio of from 1:3 to 3:1; and

B. from 1 to 20 mol, per mol of tungsten in component (A), of an organometallic aluminium compound.

3,966,638

ALKALINE EARTH METAL ORGANOMETALLIC COMPOUNDS, THEIR PREPARATION BY METALLATION AND CATALYSTS COMPRISING SAME

Ivan Glen Hargis, 679 Atwood Drive, Tallmadge, Ohio 44278, and Russell Anthony Livigni, 2291 Manchester Road, Akron, Ohio 44314

Division of Ser. No. 69,476, Sept. 3, 1970. This application Nov. 15, 1974, Ser. No. 524,336

Int. Cl.² B01J *31/12*; C07D *311/82*

U.S. Cl. 252—431 R **5 Claims**

1. A composition of matter useful as a homogeneous anionic polymerization catalyst comprising active catalyst material dissolved in an aprotic polar solvent selected from the group consisting of dialkoxyalkanes, dialkoxypolyalkanes, heterocyclic ethers, dialkyl ethers, peralkyl alkylene polyamines, peralkyl phosphoramides and mixtures thereof formed by reacting in said solvent metal selected from the group consisting of barium, strontium and calcium with heterocyclic compound selected from the group consisting of xanthene, 9-phenylxanthene, 9-α-naphthyl xanthene and 9-(2-methoxyphenyl) xanthene to convert at least part of said heterocyclic compound into active catalyst material selected from the group consisting of dixanthenyl calcium, bis (9-phenyl xanthenyl) calcium, bis(9-α-naphthyl xanthenyl) calcium, bis [9-(2-methoxyphenyl) xanthenyl] calcium, dixanthenyl strontium, bis (9-phenyl xanthenyl) strontium, bis (9-α-naphthyl xanthenyl)strontium, bis [9-(2-methoxyphenyl) xanthenyl] strontium, dixanthenyl barium, bis (9-phenyl xanthenyl) barium, bis (9-α-naphthyl xanthenyl) barium and bis [9-(2-methoxyphenyl) xanthenyl-α] barium.

3,966,639

AMPHORA AGGREGATES

James L. Callahan, Bedford Heights; Arthur F. Miller, and Wilfrid G. Shaw, both of Lyndhurst, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 271,387, July 13, 1972, Pat. No. 3,848,033. This application July 22, 1974, Ser. No. 490,429

Int. Cl.² B01J *35/08*

U.S. Cl. 252—439 **3 Claims**

1. An aggregate having a spherical or semispherical shape, a void center and a single cavity in the external surface communicating to the void center prepared by

a. preparing a slurry, the slurry comprising a suspending liquid and distinct particles of a first solid suspended in said liquid;

b. preparing a particle bed consisting of particles of a second solid;

c. forming droplets of the slurry; and

d. dropping the droplets of the slurry into the particle bed in such manner that the total droplet is not immersed in the powder and under conditions where the suspending liquid is at least partially removed from the slurry droplet to form an aggregate of the distinct particles of the first solid.

3,966,640

SUPPORTED COBALT SULFATE DESULFURIZATION CATALYST

Sheldon B. Katz, Cleveland; Frederick J. Burton, Jr., Bay Village, and Leonard A. Cullo, Solon, all of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Filed June 28, 1974, Ser. No. 483,982

Int. Cl.² B01J *27/02*

U.S. Cl. 252—440 **10 Claims**

1. A catalyst composition consisting essentially of cobalt sulfate deposited in a finely divided crystalline form as the essential catalytic ingredient on a catalyst support.

3,966,641

SORPTIONAL CARRIER MATERIALS AND A PROCESS FOR THE PREPARATION THEREOF

Kálmán Csatar, and István Soha, both of Budapest, Hungary, assignors to Országos Érc- és Ásványbányák, Budapest, Hungary

Filed Feb. 27, 1975, Ser. No. 553,552

Claims priority, application Hungary, Mar. 6, 1974, CA 363

Int. Cl.² B01J *21/08*, *29/00*, *29/06*

U.S. Cl. 252—449 **6 Claims**

1. A porous carrier rock-based sorptional carrier consisting of at least one porous carrier rock selected from the group which consists of silicic earth, pumices, tuffs, bubble-porous lava rocks, expanded perlite, vermiculite, chalks, other porous biogeneous limes, and porous sand rocks in an amount not exceeding 95% by weight and 5 to 30% by weight of a clay mineral in a particle size of about 0.1 to 1μ and selected from the group which consists of montmorillonite, illite, kaolinite, and co-minerals thereof provided that montmorillonite is present in an amount of at least 5% by weight, having a multiple sorptional pore space, possessing a sorption capacity of at least 50%, and being quasi-spherical in shape.

3,966,642
HYDROCARBON CONVERSION CATALYST

Edgar R. Black, Aspinwall; Angelo A. Montagna, Monroeville, and Harold E. Swift, Gibsonia, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 441,059, Feb. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 291,263, Sept. 22, 1972, abandoned. This application Apr. 18, 1974, Ser. No. 461,907

Int. Cl.² B01J *29/06*

U.S. Cl. 252—455 R **11 Claims**

1. A hydrocarbon conversion catalyst comprising:

a laminar 2:1 layer-lattice aluminosilicate mineral possessing layer-lattice unit cells, each cell having an inherent negative charge balanced by cations exterior to said unit cell; and

a hydrogenation component;

said mineral corresponding to the following overall formula prior to drying and calcining:

$$[(Al_{4-re}^{3+}\ Y_{3w}^{3+})^{rf}\ (Q_{8-z}^{4+}\ Al_z^{3+})^{iv}\ O_{20}\ (OH)_{4-f}F_f][dC^y]$$

where

Al is aluminum;

Y is selected from the class consisting of nickel, cobalt and mixtures thereof;

Q is at least 0.95 mol fraction silicon ions, the remainder consisting of tetravalent ions having an ionic radius not to exceed 0.65 A; and

F is fluorine;

C is at least one charge-balancing cation: and where e has a numerical value from 2 to 3 inclusive;

w has a numerical value from 0.01 to 2 inclusive, with the proviso that the quantity ew have a numerical value from 0.02 to 4 inclusive:

f has a value of 4 or less;

x has a numerical value from 0.05 to 2.0 inclusive;

y is the valence of the cation C;

d is the number of cations C where the product $dy = x + 3$ $(e-2)w$;

and wherein said first bracket represents said layer-lattice unit cell formation and said second bracket represents said charge-balancing cations.

3,966,643
RARE EARTH TRANSITION METAL EXCHANGED FAUJASITES AND CATALYSTS PREPARED THEREFROM

Julius Scherzer, and Philip K. Maher, both of Baltimore, Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 232,309, March 6, 1972, abandoned, which is a continuation of Ser. No. 50,359, June 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 854,305, Aug. 29, 1969, abandoned. This application Feb. 15, 1974, Ser. No. 442,981

Int. Cl.² B01J *29/06*

U.S. Cl. 252—455 Z **7 Claims**

1. A method for preparing the catalytically active faujasite which contains 0.2 to 3% by weight transition metal ions calculated as

$$M \frac{1}{n} O$$

wherein M is a transition metal ion selected from the group consisting of Cr, Fe and mixtures thereof, and *n* is the valence of M, and 2 to 15% by weight rare earth ions calculated as RE_2O_3 which comprises:

a. exchanging sodium faujasite with a mixture of chromium and rare earth ions in aqueous solution, said solution having a pH of 2 to 4 and from about 0.01 to 0.2 moles transition metal ions per liter and from 0.1 to 0.4 RE ions per liter; and

b. calcining said exchanged faujasite at a temperature of 600° to 1500°F.

3,966,644
SHAPED CATALYST PARTICLES

William Roy Gustafson, Trumbull, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 385,519, Aug. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 255,491, May 22, 1972, abandoned. This application Sept. 24, 1974, Ser. No. 508,780

Int. Cl.² B01J *21/12*, *29/06*

U.S. Cl. 252—455 R **7 Claims**

1. A porous hydrotreating catalyst particle having a composition comprising a major portion of alumina; up to about 36 weight percent of silica, based on the total weight of silica and alumina; from about 10 to 25 weight percent of molybdenum in the form of its oxide or sulfide; and a total of about 1 to 8 weight percent of a metal selected from cobalt, nickel and mixtures thereof in the form of the corresponding oxide or sulfide, said percentages being based on the total weight of said catalyst particle; said particle being further characterized by a polylobal cross-sectional shape defining a concave geometric solid, said cross-sectional shape being defined by circles, all of said circles in said cross-sectional shape having equal diameters, the centers of said circles being spaced from one another by a distance which is from about ⅜ to about 15/16 of the diameters of said circles and when more than two lobes are present, lines connecting the centers of adjacent circles form a substantially equilateral polygon, each side of said polygon being from ⅜ to 15/16 of the diameters of said circles and all of said cross-sectional shape included by said circles being of said composition; said particle size being defined by a ratio of geometric volume to geometric surface in the range of about 0.001 to 0.042 inch; a catalytic surface area greater than 150 square meters per gram; and a catalytic pore volume in the range of about 0.35 to 0.85 cubic centimeters per gram, said pore volume resulting from a major portion of pores of diameter in the range of 40 to 90 Angstrom units when measured with mercury at up to about 50,000 pounds per square inch absolute pressure and a contact angle of 140°.

3,966,645

CATALYST

James Anthony Cairns, Wantage, and Stanley Frederick Pugh, Abingdon, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Feb. 14, 1975, Ser. No. 550,146

Claims priority, application United Kingdom, Feb. 22, 1974, 8303/74; May 13, 1974, 20988/74

Int. Cl.² B01J *21/04, 23/84, 35/02*

U.S. Cl. 252—465 20 Claims

1. A catalyst comprising particles, the exposed area of which supports a substantially homogeneous, sputtered coating of catalytic material, a major proportion of the coating comprising an unagglomerated atomic dispersion, said coated particles being in association with support material compatible with the coated particles, such that the support material and the coated particles are adhered together.

3,966,646

FABRICATING BODIES

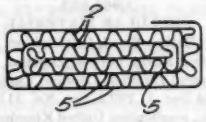
Michael Lesney Noakes, Reading; Wilfred George Caesar, Pangbourne, Nr. Reading; William Henry Holland, Wallingford, and Norman Herbert Hancock, Wantage, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 29, 1974, Ser. No. 519,016

Claims priority, application United Kingdom, Nov. 8, 1973, 51974/73

Int. Cl.² B01J *35/02*; B21D *11/06*

U.S. Cl. 252—477 R 28 Claims



1. A method of manufacturing a body, which method comprises the steps of forming a single elongate strip of material with regions comprising; alternately along the length of the strip, a plain region and a region of protrusions; laying the, or each, plan region onto the, or each, region of protrusions by folding the strip about an axis extending across the strip transverse to the length of the strip; and winding the folded strip onto itself, starting at the axis about which the strip is folded to form a coil which comprises alternate layers of plain and corrugated strip.

3,966,647

PERFUME COMPOSITIONS CONTAINING MONOALKYL-PARA-DIOXANES

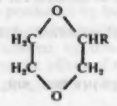
Vincent Lamberti, Upper Saddle River, and Eddie N. Gutierrez, Fort Lee, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 452,222, March 18, 1974, abandoned. This application Apr. 8, 1975, Ser. No. 566,580

Int. Cl.² C11B *7/00*

U.S. Cl. 252—522 5 Claims

1. A perfume blend comprising about 10% to about 90% by weight of phenylethyl alcohol, the balance being a compound of the formula



wherein R is a straight-chain hydrocarbon radical having from about 4 to about 22 carbon atoms, and mixtures thereof.

3,966,648

2-ALKYL-OCT-5-EN-2-OLS IN FRAGRANCE COMPOSITIONS

Alfred A. Schleppnik, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 211,789, Dec. 23, 1971, Pat. No. 3,859,366. This application Jan. 9, 1974, Ser. No. 432,012

Int. Cl.² A61K *7/46*

U.S. Cl. 252—522 2 Claims

1. A fragrance composition having incorporated therein an odoriferous amount of cis-2-methyl-oct-5-en-2-ol and at least one carrier commonly used in fragrance compositions.

2. A fragrance composition having incorporated therein an odoriferous amount of cis-2-methyl-oct-5-en-2-yl acetate and at least one carrier commonly used in fragrance compositions.

3,966,649

LIQUID DETERGENTS CONTAINING CHELIDAMIC ACIDS AND SALTS THEREOF

Bao-Ding Cheng, Highland Park, N.J., assignor to Colgate-Palmolive Company

Continuation of Ser. No. 293,090, Sept. 28, 1972, abandoned. This application Jan. 16, 1974, Ser. No. 433,649

Int. Cl.² C11D *1/29, 3/28, 3/33, 17/08*

U.S. Cl. 252—542 1 Claim

1. A detergent composition consisting essentially of 19 percent by weight of $RO(C_2H_4O)_3SO_3Na$ wherein R is a mixed C_{12-15} normal primary alkyl group, 12 percent by weight of sodium sulfate, 10.3 percent by weight of a condensation product of higher fatty alcohol of 14 to 15 carbon atoms with 11 moles of ethylene oxide, 22 percent by weight of chelidamic acid, 10.3 percent by weight of linear dodecyl benzene sulfonate, 8.6 percent by weight of isopropyl alcohol and the balance water.

3,966,650

POLYETHER URETHANE FOAM

Bela Prokai, Mahopac, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 334,767, Feb. 22, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,861

Int. Cl.² C08K *5/54*; C08G *18/14*

U.S. Cl. 260—2.5 AH 27 Claims

1. A process for producing high resilience polyether urethane foam, said process comprising foaming and reacting a mixture comprising:

I. organic polyol selected from the group consisting of (A) a polyether triol containing at least 40 mole per cent primary hydroxyl groups and having a molecular weight from about 2,000 to about 8,000 and (B) a mixture of said polyether triol and another polyether having an average of at least two hydroxyl groups, said polyether triol of said mixture amounting to at least 40 weight per cent of the total polyol content;

II. organic polyisocyanate, said organic polyol and said polyisocyanate being present in the mixture in a major amount and in the relative amount required to produce the urethane;

III. blowing agent in a minor amount sufficient to foam the reaction mixture;

IV. a catalytic amount of catalyst for the production of the urethane; and

V. a cyanoalkoxy-alkyl modified siloxane fluid having the average formula

$$(X)_xR_{3-x}SiO(R_2SiO)_z[(X)(R)SiO]_ySiR_{3-x}X_x$$

wherein x has a value of 2 to 6 inclusive; y has a value of 0 to 6 inclusive; z has a value of 0 to 1 inclusive; R is a lower alkyl or phenyl radical; and X is a cyanoalkoxy-alkyl radical having the formula $-(O)_nR'OR''CN$ where n has a value of 0 or 1, R' is an alkylene radical having from 3 to 8 carbon atoms and R'' is an alkylene radical having from 2 to 4 carbon atoms said siloxane containing at least one of said cyanoalkoxy-alkyl radicals and having an average molecular weight in the range of about 400 to about 2000, in an amount sufficient to stabilize the foam against voids and shrinkage.

3,966,651

PROCESS FOR THE PRODUCTION OF FINE-CELL POLYOLEFIN FOAMS

Frank Gerald Kleiner, Cologne, and Karl Heinz Müller, Quadrath-Ichendorf, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Oct. 8, 1974, Ser. No. 513,126

Claims priority, application Germany, Oct. 13, 1973, 2351515

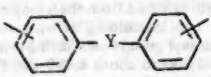
Int. Cl.² C08J 9/06, 9/10

U.S. Cl. 260—2.5 HA 13 Claims

1. A process for the production of a fine-celled foam which comprises forming a mixture of a polyolefin, a crosslinking amount of an organic peroxide capable of crosslinking the polyolefin, 2 to 30 percent by weight, based on the weight of the mixture, of a principal blowing agent having a decomposition point or decomposition range above about 190°C. and 0.1 to 1.5 percent by weight, based on the weight of said principal blowing agent, of an auxiliary blowing agent working up said mixture to form a shaped object under conditions that neither crosslinking nor appreciable foaming thereof takes place and subsequently crosslinking and foaming said shaped object by heating it to a temperature above 190°C., said auxiliary blowing agent being a disulfonylhydrazide of the formula

$$H_2NHNO_2S\text{-}X\text{-}SO_2NHNH_2$$

wherein X is an alkyl radical having up to 6 carbon atoms, a cycloalkyl radical having 4 to 7 carbon atoms, an aryl radical having 6 to 12 carbon atoms or an aromatic radical of the formula



wherein Y is 0, SO_2, S or a bond or a sulfonylhydrazide of the formula

$$X\text{-}SO_2\text{-}NH\text{-}NHR$$

wherein X is as aforesaid and R is acyl having 3 to 6 carbon atoms or -R'COR'' wherein R' and R'' are the same or different aliphatic radicals having 1 to 5 carbon atoms.

3,966,652

METHOD OF MAKING FOAMED COPOLYIMIDES AND PRODUCT OBTAINED THEREFROM

John Gagliani, San Diego, and John V. Long, El Cajon, both of Calif., assignors to International Harvester Company, Chicago, Ill.

Filed Nov. 11, 1974, Ser. No. 522,765

Int. Cl.² C08J 9/02

U.S. Cl. 260—2.5 N 7 Claims

1. A process of making a copolyimide foam which comprises the steps of: dissolving two or more diamines in a mixture of an esterifying agent and one or more esters of a tetracarboxylic acid in an amount such that the imide forming functionalities are substantially equimolar, one of said diamines being heterocyclic and having nitrogen in the ring, another of said diamines being a para- or meta-substituted aromatic diamine which is free of aliphatic moieties, and any additional diamine being either a heterocyclic or an aromatic diamine as aforesaid; adding from 0.1 to 10 parts by weight of a surfactant based on the weight of the ester and diamine constituents; heating the resulting material at a temperature in the range of 150°–250°F until the volatiles content of the material is from one to five percent lower than the theoretical volatiles content of the ester and diamine constituents; and thereafter heating the unfoamed precursor material existing at the end of said step of reducing the volatiles content to a temperature in the range of 220°–325°F to develop a polymeric foam and then to a temperature of 550°–600°F to cure the foam.

3,966,653

CELLULAR MATERIAL

Geoffrey Vincent Dallow Blunt, Cheltenham, and Newton John Hodges, Charlton Kings, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Dec. 1, 1972, Ser. No. 311,318

Claims priority, application United Kingdom, Dec. 20, 1971, 58987/71; Apr. 6, 1972, 15941/72; Sept. 1, 1972, 40545/72

Int. Cl.² C08J 9/00; C08L 63/00, 95/00

U.S. Cl. 260—2.5 EP 40 Claims

1. A cellular material consisting of between 5% and 80% of a coal pitch selected from coal tar pitches and coal digests and an epoxy resin, and including at least 25% by volume of cells.

3,966,654

STABLE ROSIN DISPERSIONS

Paul H. Aldrich, Greenville, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 386,135, Aug. 6, 1973, abandoned. This application Aug. 1, 1975, Ser. No. 601,566

Int. Cl.² C08L 93/04

U.S. Cl. 260—24 21 Claims

1. An aqueous fortified rosin dispersion consisting essentially of, by weight, (A) from about 5% to about 50% fortified rosin, (B) from about 0.5% to about 10% of watersoluble cationic resin dispersing agent, and (C) water to 100%, component (B) being selected from the group consisting of (i) a water-soluble polyaminopolyamide-epichlorohydrin resin, (ii) a water-soluble alkylenepolyamine-epichlorohydrin resin and (iii) a water-soluble poly(diallylamine)-epichlorohydrin resin, said fortified rosin being the adduct reaction product of rosin and an acidic compound containing the

group.

3,966,655

MANUFACTURE OF POLYESTER IMIDE DISPERSIONS

Jenoe Kovacs, Bobenheim-Roxheim; Hans Jung, Ludwigshafen; Matthias Marx, Bad Duerkheim; Herbert Spoor, Limburgerhof, and Wilfried Roschke, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Oct. 10, 1974, Ser. No. 513,834

Claims priority, application Germany, Oct. 11, 1973, 2351077; Oct. 11, 1973, 2351078

Int. Cl.² C08J *3/08, 3/12*

U.S. Cl. 260—29.2 N 12 Claims

1. A process for the manufacture of an aqueous polyester imide dispersion containing 20 to 60% by weight of said polyester imide in the form of solid particles having a diameter of less than 5 μm, said process comprising the steps of solidifying a composition consisting essentially of a molten polyester imide, comminuting the solid polyester imide in the dry state to particle sizes of about 10 to 100 μm at temperatures of less than 100°C, and thereafter milling the comminuted particles in water at temperatures of less than 80°C to a diameter of less than 5 μm, more than 80% of the particles having a diameter of less than 1 μm.

3,966,656

AQUEOUS ORGANIC BASE SOLUTION OF POLYHYDRAZIDES

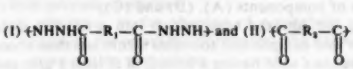
Jon David Hartzler, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 23, 1974, Ser. No. 508,654

Int. Cl.² 264 *184;* C08L *79/06*

U.S. Cl. 260—29.2 N 8 Claims

1. A film and/or fiber forming solution comprising a (co)polyhydrazide in an aqueous solution of an organic base selected from the group consisting of tetramethylammonium hydroxide, and tetraethylammonium hydroxide, tetrapropylammonium hydroxide, and the (co)polyhydrazide being characterized by substantially equimolar amounts of repeating structural units of the formulae



wherein R_1 and R_2 represent divalent radicals individually selected from the group of organic radicals of 1–12 carbon atoms, 2,5-pyridinediyl radicals, or a chemical bond.

3,966,657

AMBIENT TEMPERATURE COMPENSATED RESIN-HARDENER FILLERS

Kenneth G. Klatt, Brown Deer; Ronald L. Walling, Sussex, and James R. Hallstrom, Brookfield, all of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed Feb. 5, 1974, Ser. No. 439,746

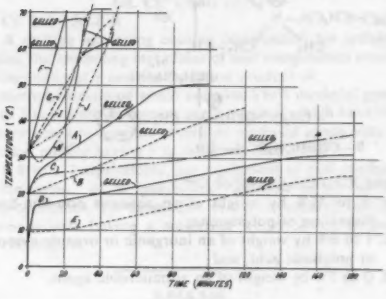
Int. Cl.² C08G *51/24*

U.S. Cl. 260—29.2 EP 6 Claims

1. A method of altering the working time of an epoxy filling compound to compensate for ambient temperatures comprising:

forming a stable resin blend including a cross-linkable epoxy resin and water, wherein the epoxy resin contains more than one alpha-epoxy group capable of being converted to thermoset form;

selecting a cross-linking agent for the epoxy resin from the group consisting of water soluble polyamines, water soluble polyamides, water soluble polyamidoamines, water soluble tertiary amines, or mixtures thereof according to the heat change produced by intermixing water with the cross-linking agent, said selection being made so that the heat change produced by intermixing water and said agent counteracts the effect of the ambient temperature on the working time and curing time; thoroughly intermixing said agent with a mixture of cement and sand to afford a hardener blend; and,



intermixing just prior to application to a working area, said resin blend with said hardener blend to obtain a curable compound with a compensated working time and curing time.

3,966,658

LIQUID PHENOL-ALDEHYDE ADHESIVE FOR USE IN CURTAIN-COATING ADHESIVE APPLICATORS

Paul Robitschek, Eugene; Norman Andrew Chappelle, Springfield, and John Wallace Lorimer, Eugene, all of Oreg., assignors to Chembond Corporation, Springfield, Oreg.

Continuation of Ser. No. 295,599, Oct. 6, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,366

Int. Cl.² C08L *61/10, 61/14*

U.S. Cl. 260—29.3 10 Claims

10. For use in the formulation of a liquid adhesive composition applicable in adhesive applicators of the curtain-coating class, a liquid, alkaline phenol-formaldehyde resinous adhesive containing from about 0.01% to about 5% by weight, based on the weight of the liquid resinous adhesive of a curtain-improving additive of the group consisting of 2,4,7,9-tetramethyl-5-decyne-4,7-diol and the ethylene glycol-, propylene glycol-, and butylene glycol-ethers thereof having from 1 to 10 moles of glycol per mole of diol.

3,966,659

PROCESS FOR THE PERMANENT FINISHING OF FIBER MATERIALS

Josef Oxé, Arlesheim, and Rudolf Keller, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 226,511, Feb. 15, 1972, Pat. No. 3,835,148. This application June 4, 1974, Ser. No. 476,243

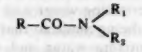
Claims priority, application Switzerland, Feb. 16, 1971, 2248/71

Int. Cl.² C08F *112/08;* C09K *3/16*

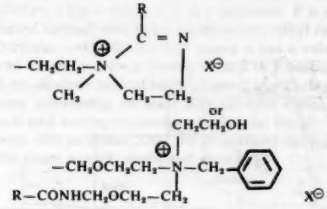
U.S. Cl. 260—29.6 MN 11 Claims

1. A preparation for use in giving fiber materials a permanent antistatic and dirt-repellent finish, consisting essentially of an aqueous dispersion of

a. 10 to 20% by weight of an antistatic agent comprising a quaternary ammonium compound of the formula



wherein R is alkyl of 8 to 22 carbon atoms, R_1 is hydrogen, and R_2 is



and $X^{\ominus}$ is $CH_3OSO_3^{\ominus}$ or $Cl^{\ominus}$,

b. 3 to 35% by weight of an aqueous non-film-forming dispersion of polystyrene,

c. 1 to 6% by weight of an inorganic or organic monobasic or polybasic acid, and

d. 0 to 5% by weight of an antimicrobic agent.

3,966,660

METHOD FOR PREPARING VINYL FLUORIDE-HEXAFLUORO-PROPYLENE RESIN AND METHOD FOR PRODUCING A COATING THEREFROM

Yorikazu Tamura, and Yasuhisa Shishido, both of Hino, Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 457,412, April 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 267,920, June 30, 1972, abandoned. This application Oct. 30, 1974, Ser. No. 519,339

Claims priority, application Japan, July 5, 1971, 46-49444

Int. Cl.² C08L *27/20*

U.S. Cl. 260—29.6 F **11 Claims**

1. A method for preparing a vinyl fluoride-hexafluoropropylene copolymer comprising polymerizing 5 to 50 mol % of hexafluoropropylene, 0 to 10 mol % of a monomer selected from the group consisting of vinyl esters of aliphatic carboxylic acids having 1 to 6 carbon atoms or 0 to 1 mol % of a monomer selected from the group consisting of unsaturated aliphatic carboxylic acids having 3 to 6 carbon atoms, lower alkyl esters of acrylic acid having an epoxy group and lower alkyl esters of methacrylic acid containing an epoxy group, and vinyl fluoride in an aqueous suspension in the presence of an organic peroxide initiator, a fluorine-containing surface active agent and a dispersing agent selected from the group consisting of methyl cellulose, gelatine, tragacanth, starch, carboxymethyl cellulose, polyvinyl alcohol, partially saponified polyvinyl alcohol and polyacrylic acid.

3,966,661

PREPARATION OF LATICES

Alan Arthur John Feast, Eastleigh, and Charles Mack Scott, Southampton, both of England, assignors to The International Synthetic Rubber Company, Limited, England

Filed July 31, 1974, Ser. No. 493,612

Claims priority, application United Kingdom, Aug. 3, 1973, 36884/73

Int. Cl.² C08L *9/04, 9/08*

U.S. Cl. 260—29.7 H **20 Claims**

1. A continuous process for the preparation of carboxylated latices comprising:

1. Continuously supplying to a first reactor maintained at a temperature of 70° to 85°C, monomers consisting of at least one conjugated diene, at least one non-carboxylic comonomer which is a vinyl aromatic, an unsaturated nitrile or an ester of an unsaturated carboxylic acid with an alcohol having 1 to 10 carbon atoms and 0.1 to 10% of at least one ethylenically unsaturated carboxylic acid; and reaction ingredients comprising a source of peroxy disulphate ion, 1.0 to 3 parts by weight per hundred parts of monomer of an alkali metal or ammonium alkyl aryl sulphonate emulsifier, an alkali metal or ammonium electrolyte, or the reaction product of such an electrolyte with an ethylenically unsaturated carboxylic acid, and water; and polymerising the monomers for an average residence time of 3 to 5 hours.

2. Continuously removing reaction mixture from the first reactor to at least one subsequent reactor maintained at 85° to 100°C in which polymerisation is continued; and

3. Continuously recovering the carboxylated latex from the last reactor.

3,966,662

SOLID, RAPID-SETTING, RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 405,244, Oct. 10, 1973, which is a continuation-in-part of Ser. No. 327,630, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 221,784, Jan. 28, 1972, abandoned. This application May 1, 1975, Ser. No. 573,714

Int. Cl.² C08K *5/52*

U.S. Cl. 260—30.6 R **16 Claims**

1. A process for producing solid, rigid, polyurethane articles having a density of at least 1 g/cc, a percent elongation of less than 100, and which can be demolded within a period of about 5 minutes without the addition of an external source of heat, which process comprises

1. admixing, in the absence of a catalytic quantity of a catalyst for urethane formation, the components of a composition comprising

A. an amine initiated polyol having an OH equivalent weight of from about 50 to less than about 250 and from about 3 to about 8 hydroxyl groups;

B. an organic aromatic polyisocyanate;

C. a liquid modifier having a boiling point above about 150°C selected from organic phosphates, organic phosphites, organic phosphonates and mixtures thereof;

wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1 and component (C) is employed in quantities of from about 5% to about 60% by weight of the combined weights of components (A), (B) and (C);

2. placing the admixed composition into a suitable mold wherein said composition solidifies within less than about 5 minutes to a solid having a density of at least 1 g/cc and a percent elongation of less than 100; and

3. subsequently demolding the resultant article from the mold.

3,966,663

FIRE-RETARDANT INSULATION FOR ROCKET MOTORS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 31, 1975, Ser. No. 563,427

Int. Cl.² C08K *5/10;* **F02C** *3/26*

U.S. Cl. 260—31.4 R **4 Claims**

1. The combination comprised of a tetrabromo compound selected from tetrabromophthalic anhydride, tetrabromophthalimide, di(2-ethylhexyl) tetrabromophthalate, N-2-hydroxyethyl-tetrabromophthalimide, diammonium tetrabromophthalate, potassium tetrabromophthalimide, an epoxide of tetrabromophthalic anhydride, and an epoxide of tetrabromophthalimide, with a binder and a curing agent for said binder, said combination being the ingredients for use as an inert rocket motor component of a solid-propelled rocket motor, and being further identified as said inert rocket motor component which serves as either a liner composition for a

composite propellant rocket motor or a crosslinked nitrocellulose propellant rocket motor, said liner composition serves to bond the motor wall or wall insulation to the solid propellant grain of said solid-propelled rocket motor, or as an insulation or thermal barrier, said selected compound when in said combination being effective in preventing afterburning of said inert rocket motor component, said liner composition for said composite propellant rocket motor comprised of about 80–85 parts by weight of hydroxy-terminated polybutadiene prepolymer binder with a diisocyanate curing agent, of about 1–4 parts by weight of carbon black additive, of about 4–10 parts by weight of inert fillers, and a curative of about 10 parts by weight of said selected tetrabromo compound; and said liner composition for said crosslinked nitrocellulose propellant rocket motor comprised in parts by weight of a binder of about 49 parts cellulose acetate, of about 31 parts triphenyl phosphate, of about 615 parts acetone, of about 484 parts of an activator 2-methoxy ethanol acetate, of about 2–4 parts of a diisocyanate curing agent, and of about 19 parts of said selected tetrabromo compound.

3,966,664

SOLID, RAPID-SETTING, RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 405,244, Oct. 10, 1973, which is a continuation-in-part of Ser. No. 327,630, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 221,784, Jan. 28, 1972, abandoned. This application May 1, 1975, Ser. No. 573,718

Int. Cl.² C08K *5/10*

U.S. Cl. 260—31.4 R **12 Claims**

1. A process for producing solid, rigid, polyurethane articles having a density of at least 1 g/cc, a percent elongation of less than 100, and which can be demolded within a period of about 5 minutes without the addition of an external source of heat, which process comprises

1. admixing, in the absence of a catalytic quantity of a catalyst for urethane formation, the components of a composition comprising
   - A. an amine initiated polyol having an OH equivalent weight of from about 50 to less than about 250 and from about 3 to about 8 hydroxyl groups.
   - B. an organic aromatic polyisocyanate;
   - C. a liquid modifier having a boiling point above about 150°C selected from the group consisting of ester-modified polyoxyalkylene compounds having an average hydroxyl equivalent weight above about 700 when such compounds contain 2 hydroxyl groups, an average hydroxyl equivalent weight above about 500 when such compounds contain 3 or more hydroxyl groups and an average molecular weight above about 700 when such compounds contain zero or 1 hydroxy group and mixtures thereof; wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1 and component (C) is employed in quantities of from about 5% to about 60 % by weight of the combined weights of components (A), (B) and (C);
2. placing the admixed composition into a suitable mold wherein said composition solidifies within less than about 5 minutes to a solid having a density of at least 1 g/cc and a percent elongation of less than about 100; and
3. subsequently demolding the resultant article from the mold.

3,966,665

COATING COMPOSITION FOR HARDENING THE SURFACE OF CELLULOSIC PLASTICS AND SHAPED ARTICLES OF CELLULOSIC PLASTICS USING SAID COATING COMPOSITION

Nobuhiro Sakata, Ashiya, and Toshihiro Suzuki, Yokohama, both of Japan, assignors to Nippon Pelnox Corporation and Nippon Sheet Glass Co., Ltd, both of, Japan

Filed Apr. 10, 1974, Ser. No. 459,851

Claims priority, application Japan, Apr. 13, 1973, 48-42421

Int. Cl.² C08G *12/32*

U.S. Cl. 260—32.8 R **5 Claims**

1. A surface hardening coating composition for cellulosic plastics, the hardening ingredient of said composition consisting essentially of a pre-condensation product of:

a. methylolmelamine which contains 3 to 6 methylol groups or 3 to 6 methylol groups at least part of which have been converted to an alkyl-etherified methylol group with the alkyl moiety having 1 to 6 carbon atoms and

b. 0.8 to 1.2 equivalents, per equivalent of said methylolmelamine, of a polyhydric alcohol which is 1,3-propanediol, 1,4-butanediol or 1,8-octanediol, said precondensate having a molecular weight of up to about 100,000.

3,966,666

CONTINUOUS PROCESS FOR PREPARING A SPINNING SOLUTION OF ACRYLIC POLYMERS

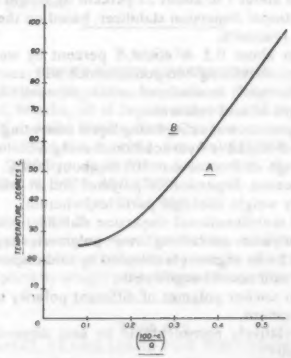
Paolo Melacini, Mestre; Luigi Patron; Giorgio Doria, both of Venice, and Raffaele Tedesco, Mestre, all of Italy, assignors to Montefibre S.p.A., Milan, Italy

Filed June 5, 1974, Ser. No. 476,698

Claims priority, application Italy, June 14, 1973, 50787/73

Int. Cl.² C08K *5/17;* **D01F** *6/18*

U.S. Cl. 260—32.6 N **11 Claims**



1. A continuous method for preparing a spinning solution of acrylic polymers directly from an acrylonitrile polymerization slurry obtained by bulk polymerization, this method comprising,

a. adding to said polymerization slurry a solvent in such quantity as to be insufficient to attack and dissolve the polymer and to result in a polymer/monomer/solvent mixture having a viscosity less than 2 poises;

b. bringing the resulting mixture to a temperature (T) exceeding room temperature and not exceeding 170°C, said temperature (T) being such that there is no appreciable attack of the polymer by the solvent;

c. removing at least 30% of unreacted monomer or monomers by vacuum adiabatic evaporation; and

d. heating the resulting mixture to a temperature not exceeding 170°C, said temperature being such as to result in said solvent attacking and completely dissolving the polymer.

3,966,667

PREPARATION OF NON-AQUEOUS THERMOSETTING ACRYLIC POLYMER DISPERSIONS

Thomas R. Sullivan, Natrona Heights; John W. Du, Natrona; Raymond L. Pelegrinelli, Cheswick, and Suryya K. Das, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 11, 1972, Ser. No. 296,705

Int. Cl.[2] C08J *3/08*; **C08K** *5/01, 5/02, 5/04*

U.S. Cl. 260—33.6 UA **6 Claims**

1. A method of preparing a nonaqueous polymer composition comprising

a. forming a polymer from reactants comprising

1. about 70 to about 98 percent by weight of ethylenically unsaturated monomers, based on the weight of said reactants, wherein said ethylenically unsaturated monomers comprise

a. from about 4 to about 30 percent by weight hydroxy-containing ethylenically unsaturated monomer, based on the weight of said reactants, and

b. from about 0.5 to about 5 percent by weight ethylenically unsaturated carboxylic acid, based on the weight of said reactants,

2. from about 1 to about 25 percent by weight of a multifunctional dispersion stabilizer, based on the weight of said reactants,

3. from about 0.5 to about 5 percent by weight of an imine-containing compound which will react with said ethylenically unsaturated carboxylic acid, based on the weight of said reactants,

in the presence of a dispersing liquid consisting essentially of liquid aliphatic hydrocarbons having a boiling point in the range of from about 30° to about 300°C. to form a nonaqueous dispersion of polymer and at least 0.5 percent by weight microgel particles, wherein

4. said multifunctional dispersion stabilizer is a branched copolymer containing two polymeric segments of which one segment is solvated by said dispersing liquid and said second segment is

a. an anchor polymer of different polarity to said first segment,

b. relatively nonsolvatable by said dispersion liquid, and

c. contains pendant groups which are copolymerizable with said ethylenically unsaturated monomers, and

(5) said microgel particles

a. being substantially crosslinked,

b. being substantially insoluble in tetrahydrofuran,

c. having substantially the same refractive index as that of said polymer, and

d. being of size in the range of from about 1 to about 40 microns,

and

b. adding active solvent to said nonaqueous dispersion to form a solution of said polymer containing dispersed microgel particles wherein the ratio of said active solvent to said dispersing liquid is in the range of from about 35:65 to about 90:10.

3,966,668

CARBON BLACK DISPERSIONS AND METHOD OF MAKING SAME

Alfred R. Cain, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 447,321, March 1, 1974, abandoned, which is a continuation of Ser. No. 385,525, Aug. 3, 1973, abandoned, which is a continuation of Ser. No. 268,242, July 3, 1972, abandoned. This application Dec. 11, 1974, Ser. No. 531,574

Int. Cl.[2] C08L *75/06, 75/08*

U.S. Cl. 260—37 N **4 Claims**

1. The process of making a flowable, castable polyurethane rubber precursor containing carbon black by subjecting a mixture of

		% based on the weight of Component (A)
(A)	a flowable, castable polyurethane precursor	100
and		
(B)	a porous carbon black, said porous black having been subjected to heat treatment at high temperatures in an oxygen-containing atmosphere, resulting in a ratio of diameter of the carbon black particles determined by nitrogen absorption to the diameter of the carbon black as determined by microscopic examination of at least 1.2:1	5 – 40

to a vacuum

of 20 mm or less of mercury

for a duration of one hour or more at a temperature of 30°–200°C to substantially reduce the viscosity thereof, said precursor composition, when cast and cured, resulting in polyurethane products of improved physical properties reflecting a high degree of reinforcement by the carbon black.

3,966,669

POWDER COATINGS HAVING A VARIEGATED, SPECKLED APPEARANCE

Norman Gilbert Wolfe, New Albany, Ind., assignor to Celanese Coatings & Specialties Company, Louisville, Ky.

Filed Sept. 30, 1974, Ser. No. 510,339

Int. Cl.[2] C09D *5/29*

U.S. Cl. 260—37 EP **7 Claims**

1. a powder coating composition capable of producing a speckled coating after being baked which comprises a physical blend of a finely divided fusible polymeric film forming coating composition and an oil soluble dye wherein the dye is present in the amount of about 0.03 weight percent to about 0.3 weight percent based on the weight of the polymeric film forming coating composition and wherein the dye has a particle size of about 0.01 to about 50 microns.

3,966,670

FRICTION PARTICLE FOR BRAKE LINING

Frank S. Grazen; Melvin L. Buike, and Frank M. Bryzinsky, all of North Tonawanda, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 319,109, Dec. 27, 1972, Pat. No. 3,873,490, which is a division of Ser. No. 188,598, Oct. 12, 1971, Pat. No. 3,781,241, which is a division of Ser. No. 872,753, Oct. 30, 1969, Pat. No. 3,658,751. This application Dec. 23, 1974, Ser. No. 535,910

Int. Cl.² C08G *37/18, 51/10*

U.S. Cl. 260—38 6 Claims

1. A friction particle consisting essentially of the non-catalyzed product of the reaction at about 225° to about 400° Fahrenheit of about 95 to about 60 percent by weight of a non-hydroxyalkylated, alkylated hydroxy aromatic hydrocarbon aldehyde resole containing substantially no etherified aromatic hydroxyl groups with about 5 to about 40 percent by weight of a hydroxyalkylated hydroxy aromatic hydrocarbon-aldehyde novolac until the product is substantially insoluble in acetone, infusible, and does not soften slightly under mechanical force at a temperature below about 400° Fahrenheit and has substantially no cohesive or bonding strength, wherein the alkylated groups of said alkylated resole are selected from the groups consisting of:

a. alkyl groups of 1 to 60 carbon atoms.
b. cycloalkyl groups of 5 to 12 atoms.
c. alkyl, aryl and cycloalkyl ketonic groups wherein the hydrocarbon portion is as defined in (a) and (b).
d. alkyl, aryl and cycloalkyl carboxylic groups wherein the hydrocarbon portion is as defined in (a) and (b).
e. aryl groups of 6 to 24 carbon atoms, and
f. aryl substituted alkyl wherein the aryl is phenyl, lower alkyl-substituted phenyl or hydroxy substituted phenyl.

3,966,671

POLYESTER COMPOSITION

Clive Percy Smith, Wheathampstead, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 27, 1975, Ser. No. 544,668

Claims priority, application United Kingdom, Feb. 22, 1974, 8150/74

Int. Cl.² C08K *5/09*

U.S. Cl. 260—40 R 10 Claims

1. A reinforced polyester composition comprising a crystalline thermoplastic linear polyester, 2 to 80 percent by weight of the composition of a reinforcing filler and sufficient of an aliphatic monobasic carboxylic acid or a salt thereof containing 1 to 8 carbon atoms to increase the melt viscosity of the composition under low shear conditions.

3,966,672

PREPARATION OF CARBOXYL-CONTAINING POLYMERS AND COMPOSITES THEREOF WITH HYDROXYL-CONTAINING MATERIALS

Norman G. Gaylord, New Providence, N.J., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 20, 1974, Ser. No. 525,333

Int. Cl.² C08K *3/20, 9/04;* C08L *13/00, 23/26*

U.S. Cl. 260—42.14 18 Claims

1. A process for preparing a carboxyl-containing polymer which comprises subjecting a mixture of a mono- or diolefin polymer having a number average molecular weight of at least about 10,000 and a thermoplastic copolymer of a carboxyl-containing monomer and a monomer copolymerizable therewith, the molar ratio of carboxylic acid component to copolymerizable monomer being such that there will be at least one carboxyl group present for each molecule of copolymer present in the mixture, said copolymer having a number average molecular weight of about 500 to 5000 and being present at a concentration of about 0.1 to 25%, based on the total weight of mono- or diolefin polymer and carboxyl-containing copolymer, to shearing forces at a temperature above the softening point of both the mono- or diolefin polymer and the carboxyl-containing copolymer.

3,966,673

POLYVINYLCHLORIDE POLYMER INHIBITED AGAINST RELEASE OF HYDROGEN CHLORIDE AT ELEVATED TEMPERATURE

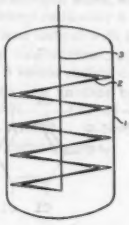
Siegmund Frick, Troisdorf-Oberlar; Wilhelm Gresser, Troisdorf; Gunther Meyer, Troisdorf-Sieglar, and Gerhard Bier, Troisdorf, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed July 13, 1973, Ser. No. 377,687

Claims priority, application Germany, July 15, 1972, 2234430

Int. Cl.² C08K *3/26, 9/10*

U.S. Cl. 260—42.49 9 Claims



1. Process of preparing vinyl chloride polymer inhibited against release of hydrogen chloride at elevated temperature, which comprises producing the polymer by polymerizing vinyl chloride in a reaction medium having calcium carbonate dispersed therein for in situ incorporation of calcium carbonate in the polymer in dispersed condition, the proportion of calcium carbonate being 90–105 percent of the stoichiometric amount which is 50.04 g $CaCO_3$ per 62.5 grams of vinyl chloride in the polymer.

3,966,674

EPOXY RESIN COMPOSITION

Masaaki Takahashi; Akira Ito, both of Tokyo, and Yuriko Igarashi, Mitaka, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1974, Ser. No. 511,308

Claims priority, application Japan, Oct. 9, 1973, 48-112885; Oct. 9, 1973, 48-112886

Int. Cl.² C08J *3/20*

U.S. Cl. 260—45.7 R 5 Claims

1. An epoxy resin composition having stabilized electrical properties comprising 100 parts by weight of an epoxy resin and 5–50 parts by weight propylfluoranthene or propylpyrene.

3,966,675

THERMAL STABILIZERS FOR POLYPROPYLENE

Edward Joseph Schurdak, Somerville, and Christos Savides, Piscataway, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 11, 1974, Ser. No. 522,385

Int. Cl.² C08J *3/20*

U.S. Cl. 260—45.8 NT 5 Claims

1. A stabilizer composition useful in the synergistic enhancement of the resistance of polypropylene to thermal degradation comprising, in combination, pentaerythritol tetrakis(3-n-dodecylthiopropionate) and either bis(4-t-butyl-3-hydroxy-2,6-dimethylbenzyl) dithiolterephthalate or 1,3,5-tris(4-t-butyl-3-hydroxy-2,6-dimethylbenzyl)-s-triazine-2,4,6-(1H,3H,5H)-trione.

2. A composition comprising polypropylene and a stabilizing amount of the stabilizer composition of claim 1.

3,966,676

BIS-(HALOPHENYL) 2,3,5,6-TETRACHLORO-TEREPHTHALATE AND FIRE RETARDANT COMPOSITIONS PREPARED THEREFROM

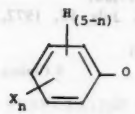
Sidney B. Richter, Chicago, and Glendon D. Kyker, Glen Ellyn, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

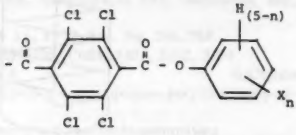
Filed Feb. 18, 1975, Ser. No. 550,332

Int. Cl.² C08J 3/20; C07C 69/82

U.S. Cl. 260—45.75 B 11 Claims

1. A compound of the formula





wherein X is chlorine or bromine, and *n* is an integer from 2 to 5.

5. A fire retardant polymeric composition comprising a combustible polymer and a fire retarding amount of the compound of claim 1.

3,966,677

SELF-EXTINGUISHING POLYSTYRENE RESIN COMPOSITION

Yuzo Sonoyama; Akira Ohi, and Yukio Hozumi, all of Sakai, Japan, assignors to Daicel Ltd., Osaka, Japan

Filed Sept. 6, 1974, Ser. No. 503,634

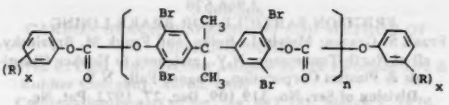
Claims priority, application Japan, Sept. 14, 1973, 48-104191

Int. Cl.² C08J 3/20

U.S. Cl. 260—45.85 T 7 Claims

1. A self-extinguishing resin composition which comprises a homogeneous mixture of

1. polystyrene resin, and
2. flame retarding agent in an amount sufficient to impart a self-extinguishing property to the resin composition, said flame retarding agent consisting essentially of
   a. a material selected from the group consisting of tricresyl phosphate, triphenyl phosphate and mixtures thereof, and
   b. a carbonate oligomer of 2,2 —4,4′-dihydroxy-3,3′, 5,5′-tetrabromodiphenyl) propane having the formula:



wherein R is hydrogen or alkyl having from 1 to 6 carbon atoms, *x* is an integer of 1 to 5 and n is an integer of 2 to 10;

the molar ratio of ingredient (a) : ingredient (b) being about 1(*n*):1, said resin composition containing from 3 to 25 percent by weight of said flame retarding agent.

3,966,678

MALEIC ANHYDRIDE-POLYALDIMINE PREPOLYMERS

Max Gruffaz, La Mulatiere, and Bernard Rollet, Lyon, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 463,249, April 23, 1974, Pat. No. 3,875,087. This application Sept. 30, 1974, Ser. No. 510,727

Claims priority, application France, Apr. 26, 1973, 73.15175

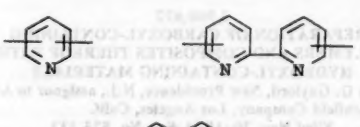
Int. Cl.² C08F 20/08; C08G 69/44; C08J 9/10

U.S. Cl. 260—47 UA 1 Claim

1. A prepolymer obtained by heating maleic anhydride and a polyaldimine of the general formula:

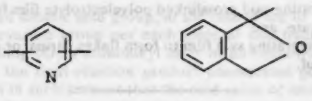
$$A\,(N=CH-G)_n$$

in which G represents a phenyl, naphthyl, pyridyl, pyrimidinyl, furyl, thienyl, benzo[b]thienyl, indolyl, triazolyl or 3,4-methylenedioxy-phenyl radical or a several said radicals connected to one another directly or via a —O—, —S—, —NH—, —COO—, —CONH—, $-SO_2-$, —N=N—, —N=N(O)—, —CO— or a linear or branched alkylene or alkenylene group with up to 8 carbon atoms, A represents a phenylene radical, a radical of the formula:

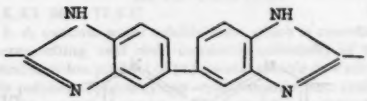


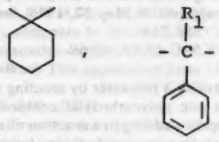
or

or a divalent radical containing 12 to 30 carbon atoms, consisting of phenylene radicals bonded to one another by a simple valency bond or by —O—, —S—, $-SO_2-$, $-NR_1-$, —N=N—, —CONH—, —COO—, $-P(O)R_1-$, —CONH—X—NHCO—, —N=N(→O)—, an alkylene group with 1 to 3 carbon atoms,

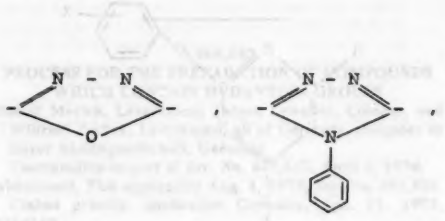


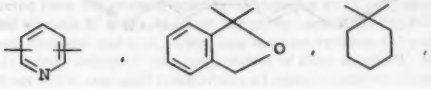
or

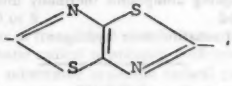


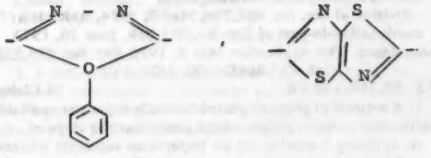


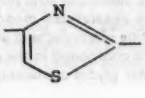
wherein R_1 represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms, a phenyl radical or a cyclohexyl radical, and X represents an alkylene radical with less then 13 carbon atoms or a 3 to 5 valent naphthalene, pyridine, triazine or benzene radical or a 3 to 5 valent radical consisting of several benzene nuclei bonded to one another by a —O—, —S—, $—SO_2—$, $—NR_1—$, —N=N—, —CONH—, —COO—, $—P(O)R_1—$, —CONH—X—NHCO—, $—N=N(\rightarrow O)—$, an alkylene group with 1 to 3 carbon atoms,

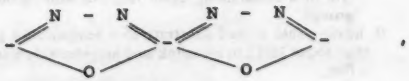


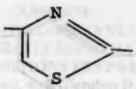




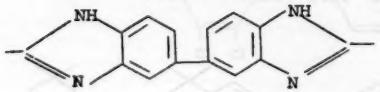




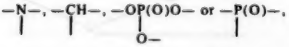




or



wherein R_1 represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms, a phenyl radical or a cyclohexyl radical, and X represents an alkylene radical with less than 13 carbon atoms or



and *n* represents a number at least equal to 2, at a temperature from 100° to 200°C.

3,966,679

ABSORBENT ARTICLES AND METHODS FOR THEIR PREPARATION

James R. Gross, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 468,794, May 9, 1974, which is a continuation-in-part of Ser. No. 371,909, June 20, 1973, abandoned. This application May 9, 1975, Ser. No. 575,920

Int. Cl.² B05D *1/00, 3/00, 3/02*

U.S. Cl. 260—47 EA **14 Claims**

1. A method of preparing a substantially dry water swellable particulate polyelectrolyte which comprises the steps of

A. applying a coating on an impervious substrate wherein the coating comprises

1. a solution of a carboxylic synthetic polyelectrolyte wherein the solution comprises water, lower alcohols, or mixtures thereof and about 5 to about 60% by weight of a carboxylic polyelectrolyte, and
2. at least about 0.1% by weight based on the polyelectrolyte of a crosslinking agent reactive with carboxylate groups,

B. heating said coated substrate to a temperature greater than about 30°C. to crosslink said polyelectrolyte to form a film,

C. separating said crosslinked polyelectrolyte film from said substrate, and

D. disintegrating said film to form flakes, strips, or powders thereof.

3,966,680

PHENOXY-S-TRIAZINE CHAIN COUPLER FOR POLYESTERIFICATION AND NOVEL POLYESTERS

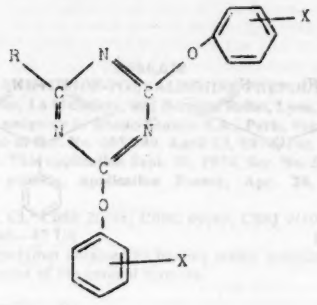
Robert L. Wear, West St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 424,351, Dec. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 323,626, Jan. 15, 1973, abandoned. This application May 27, 1975, Ser. No. 580,714

Int. Cl.² C08G *63/66, 63/68*

U.S. Cl. 260—47 C **8 Claims**

1. In the process of forming a polyester by reacting at least one polyol with at least one polycarboxylic compound the improvement which comprises adding to a reaction mixture of the polyol and polycarboxylic compound after polyesterification has begun, 0.67 to 3.68% by weight of a chain-coupling compound of the formula:



wherein R is an organic radical which will not render the chain-coupling compound thermally unstable at about 280°C, and

X is an inert substituent or hydrogen.

3,966,681

PROCESS FOR THE PREPARATION OF UNSATURATED POLYURETHANE RESINS

Hiroshi Maeda, Chiba; Nagao Ariga, and Takeo Matuo, both of Ichihara, all of Japan, assignors to Dainippon Ink and Chemicals, Incorporated, Tokyo, Japan

Continuation of Ser. No. 409,381, Oct. 25, 1973, abandoned. This application Jan. 13, 1975, Ser. No. 540,393

Claims priority, application Japan, Oct. 31, 1972, 47-108514

Int. Cl.² C08G *18/42, 18/04, 18/58*

U.S. Cl. 260—75 NH **3 Claims**

1. A process for preparing an unsaturated polyurethane resin containing two or more unsaturated monobasic acid residues selected from the group consisting of acrylic acid and methacrylic acid in its molecular structure which comprises reacting, in the presence of a polymerizable vinyl monomer other than acrylic or methacrylic acid, (A) a diesterified epoxy compound containing at least two hydroxyl groups, said compound obtained by reacting an epoxy compound having two epoxy groups in its molecular structure but not containing a hydroxyl group with unsaturated monobasic acid selected from the group consisting of acrylic acid and methacrylic acid, with (B) a diisocyanate compound in the presence or absence of (C) an oligopolyester glycol containing a saturated or un-

saturated dibasic acid group, at the rate of 0.2 to 1.0 mole of the isocyanate group per each mole of said hydroxyl group and adding (D) a monoalkyl ester of an unsaturated dibasic acid in the final reaction product unsaturated polyurethane solution in such amount that the acid value of said solution is at least 5.

3,966,682
POLY(TETRAMETHYLENE DIBRO MOTEREPHTHALATE)

James P. Nelson, Woodridge, Ill., and Alfred Steitz, Jr., deceased, late of Batavia, Ill. (by Margaret Marie Steitz, executrix), assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 263,195, June 15, 1972, abandoned. This application June 14, 1974, Ser. No. 479,473

Int. Cl.² C08G *63/68*

U.S. Cl. 260—75 H **3 Claims**

1. A fire-retardant polyester consisting essentially of a dicarboxylic acid component and 1,4-butanediol component wherein the dicarboxylic acid component comprises from 10 to 100 mole percent 2,5-dibromoterephthalic acid moieties and correspondingly 90 to 0 mole percent terephthalic acid moieties.

3,966,683
PROCESS FOR THE PREPARATION OF COMPOUNDS WHICH CONTAIN HYDANTOIN GROUPS

Rudolf Merten, Leverkusen; Jürgen Lewalter, Cologne, and Wilfried Zecher, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 457,852, April 4, 1974, abandoned. This application Aug. 1, 1974, Ser. No. 493,520

Claims priority, application Germany, Apr. 11, 1973, 2318198

Int. Cl.² C08G *18/24*, *18/26*, *18/18*, *18/34*

U.S. Cl. 260—77.5 AC **13 Claims**

1. A process for the preparation of a hydantoin which comprises reacting at a temperature of 50° to 350°C.

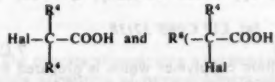
a. at least one compound of the formula

$$R^3(-NCX)_z$$

wherein X is O or S;

z is an integer of from 2 to 3 and R^3 is an optionally substituted aliphatic radical containing 1–20 carbon atoms, an optionally substituted aromatic radical containing 5–12 carbon atoms, a cycloaliphatic radical containing 5–12 carbon atoms, an aliphatic-aromatic radical containing 6–20 carbon atoms or an aromatic or cycloaliphatic heterocyclic radical containing 5–12 ring atoms which contains or is substituted by hetero atoms such as N, O or S, with

b. at least one α-halocarboxylic acid selected from the group consisting of



wherein Hal is halogen; R^4 is an optionally substituted aromatic radical containing 5–10 carbon atoms, an aliphatic radical containing 1–20 carbon atoms, a cycloaliphatic radical containing 5–10 carbon atoms, hydrogen or two radicals R^4 taken together with the carbon atom to which they are attached form a cycloaliphatic ring of 5–7 ring members; R^5 is an aliphatic radical containing 1–10 carbon atoms, a cycloaliphatic radical containing 5–10 carbon atoms, an aliphatic-aromatic radical containing 6–10 carbon atoms or an aromatic radical containing 5–10 carbon atoms and y is an integer of from 1 to 3.

3,966,684
CATIONIC WATER SOLUBLE POLYMERIC REACTION PRODUCT OF POLYAMINOPOLYUREYLENE-EPICHLOROHYDRIN AND NITROGEN COMPOUND

Herbert H. Espy, and Stearns T. Putnam, both of Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 334,338, Feb. 21, 1973, abandoned. This application Sept. 27, 1974, Ser. No. 509,869

Int. Cl.² C08G *71/04*

U.S. Cl. 260—77.5 C **9 Claims**

1. A cationic water soluble resin which is essentially nonthermosetting, said resin consisting essentially of the polymeric reaction product of (1) a water soluble or water dispersible polyaminopolyureylene--epihalohydrin base resin having epoxide moieties said base resin consisting essentially of the reaction product of urea and a polyamine containing at least three amine groups, at least one of which is a tertiary amine, in a mole ratio of the latter to the former of from about 0.7:1 to about 1.5:1 to form a polyaminoureylene containing free amine groups, at least 70% of which are tertiary amine groups, and then reacting, under alkaline conditions, the polyaminoureylene with epihalohydrin in a mole ratio of epihalohydrin to free amine groups in the polyaminoureylene of from about 1.0:1 to about 1.7:1, and (2) a nitrogen compound in an amount at least stoichiometrically equivalent to the epoxide moieties of the base resin, said nitrogen compound having the formula RRR'N wherein R is independently selected from the group consisting of hydrogen and C_1–C_4 alkyl and wherein R' is selected from the group consisting of hydrogen, hydroxyl and C_1–C_4 alkyl, said reaction between (1) and (2) being carried out at a temperature of from about 0°C. to about 150°C. and until substantially all epoxide moieties of the base resin have reacted with the nitrogen compound.

3,966,685
DIFFICULTLY INFLAMMABLE THREADS, FIBERS AND FILMS OF POLYESTERAMIDES AND PROCESS FOR OBTAINING THEM

Pierre Allard, Fontaines-sur-Saone, France, assignor to Rhone-Poulenc-Textile, Paris, France

Filed May 22, 1974, Ser. No. 472,155

Claims priority, application France, June 1, 1973, 73.20277; July 24, 1973, 73.27318

Int. Cl.² C08G *69/32*

U.S. Cl. 260—78 R **2 Claims**

1. A difficultly inflammable filament, thread, fiber or film of aromatic carbocyclic copolyester amide polymers having a melting point above 300° C to 450° C consisting essentially of about 40 to 55% of units of the formula

$$-NH-Ar_1-NH- \text{ and}$$

about 60 to 45% of units of the formula

$$-CO-Ar_2-CO-$$

and of the formula

$$-OC-Ar_3-Y_x-(Ar)_b-Y_x-Ar_4-CO-$$

wherein Ar_1, Ar_2, Ar_3, Ar_4, and Ar_5 represent a divalent aromatic carbocyclic radical and Y is

$-(CH_2)_p-O-\overset{O}{\overset{\|}{C}}-$ or $-\overset{O}{\overset{\|}{C}}-O(CH_2)_p-$

with $p = 1$ or 2, a, b, and c being equal to 0 or 1, at least one of the subscripts a or c being equal to 1, and the proportion of the units $-CO-Ar_3-CO-$ and $-OC-Ar_3-Y_a-(Ar_4)_b-Y_c-Ar_5-CO-$ being such that there are at least 15 said ester bonds per 100 total amide and ester bonds.

3,966,686

AROMATIC POLYAMIDE-TYPE FILMS

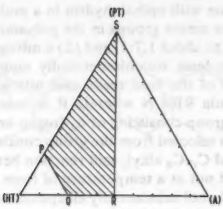
Toshiyuki Asakura; Masaaki Itoga, both of Otsu; Takeshi Hayakawa, Kyoto, and Masamitu Tanimura, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 24, 1974, Ser. No. 536,256

Claims priority, application Japan, Dec. 28, 1973, 49-1682

Int. Cl.² C08G 69/46

U.S. Cl. 260—78 A **11 Claims**



1. An aromatic polyamide-type film, substantially consisting of a member of the group consisting of at least one of p-benzamide, p-phenylene terephthalamide and terephthaloyl hydrazide recurring units as essential chain constituents, which constituents comprise at least about 70 mol % of the entire film, and which have an inherent viscosity of more than 1.0 at 25° C, a density of more than 1.41 g/cm³ at 25° C and 0% relative humidity and a planar orientation coefficient of larger than 0.65, obtained by the X-ray pole figure method, said film being substantially free of organic solvent and inorganic ionic compounds, and having been prepared by heating to the polymer crystallization temperatures while preventing free shrinkage in the machine direction and in the transverse direction.

3,966,687

ACRYLIC COPOLYMERS

Alain Ribba, Chateaurenault, France, assignor to Manufacture de Produits Chimiques Protex, Paris, France

Filed Feb. 6, 1974, Ser. No. 440,270

Claims priority, application France, Feb. 16, 1973, 73.05668

Int. Cl.² C08F 220/06, 222/28, 230/02, 230/08

U.S. Cl. 526—317 **5 Claims**

1. Copolymers obtained by interpolymerization of the following four monomers:

a. at least one alkylacrylate, the alkyl portion of which contains 1 to 8 carbon atoms, at a weight percentage of 25 to 85% of the weight of the mixture of monomers (a) to (d),

b. methacrylic acid, at a weight percentage of 15 to 75% of the weight of the mixture of monomers (a) to (d),

c. a trialkyloxyvinylsilane corresponding to the general formula:

$$CH_2 = CH - Si(OR_1)(OR_2)(OR_3)$$

wherein R_1, R_2, R_3, which are identical or different, are either an alkyl group, linear or branched, or an alkyloxyalkyl group wherein the alkyl portions are defined as above, at a weight percentage of 0.1 to 2% of the weight of the mixture of monomers (a) to (d), and

d. at least one monomer having at least two ethylenic double bonds, which can be copolymerized with monomers (a) to (c), at a weight percentage of 0.01 to 0.5% of the weight of the total monomer mixture.

3,966,688

ARYLENE SULFIDE COPOLYMER PRODUCTION

Robert W. Campbell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 3, 1974, Ser. No. 529,033

Int. Cl.² C08G 75/16

U.S. Cl. 260—79 **8 Claims**

1. A process for the production of arylene sulfide copolymers consisting of reacting:

a. a mixture of different arylene sulfide polymers in which each arylene sulfide polymer present in said mixture makes up at least 10 weight percent of the total amount of arylene sulfide polymers employed and each polymer has an inherent viscosity, determined at 206°C in 1-chloronaphthalene at a polymer concentration of 0.4g/100 ml solution, greater than 0.005, with

b. at least one organic amide selected from cyclic and acyclic amides having from 1 to 10 carbon atoms per molecule under reaction conditions including an elevated temperature sufficient to produce at least one arylene sulfide copolymer having repeating units characteristic of those of each of the arylene sulfide polymer reactants present in said mixture, and

c. at least one alkali metal sulfide present in an amount within the range of 0 to about 0.1 gram-mole of alkali metal sulfide per gram-atom of sulfur in the total amount of arylene sulfide polymers in said mixture.

3,966,689

POLYMERS BASED ON N-FORMYL-N'-ACRYLOYL-METHYLENEDIAMINES

Joachim Ribka, Offenbach am Main-Burgel; Friedrich Engelhardt, Frankfurt am Main-Fechenheim, and Steffen Piesch, Oberursel, Taunus, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Division of Ser. No. 408,488, Oct. 23, 1973, abandoned. This application Jan. 30, 1975, Ser. No. 545,550

Claims priority, application Germany, Oct. 23, 1972, 2251922

Int. Cl.² C08F 22/38

U.S. Cl. 526—306 **7 Claims**

1. A linear addition copolymer which is prepared by the process of polymerizing from 0.2 to 50% by weight of a monomer of the formula

$$H-CO-\underset{\displaystyle R^1}{N}-CH_2-NH-CO-\underset{\displaystyle R^2}{\overset{\displaystyle R^3}{C=CH}}$$

wherein R^1, R^2 and R^3 are hydrogen or alkyl having 1 to 5 carbon atoms and at least one copolymerizable olefinically unsaturated monomer, said polymerization being carried out at a temperature between 10° and 80°C. and in the presence of a free radical yielding substance.

3,966,690

MODIFIED HYDROCARBON RESINS

Glenn William Mathews, and Milton Silas Wing, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 357,434, May 4, 1973, abandoned. This application May 23, 1974, Ser. No. 472,568
Int. Cl.² C08F *232/02*, *236/04*
U.S. Cl. 526—283 3 Claims

1. A thermoplastic tackifying hydrocarbon resin having a softening point in the range from 80° to 110°C. comprising the copolymer of

A. an unsaturated C_5 feedstock which comprises a major amount of piperylene, and minor amounts of cyclopentene, isoprene, and cyclopentadiene wherein the resin comprises from about 85 to about 60 weight percent of said feedstock and wherein greater than 50 weight percent of the resin comprises piperylene moieties and

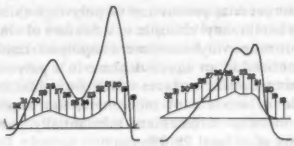
B. diisobutylene wherein the resin comprises from about 15 to about 40 weight percent of said diisobutylene.

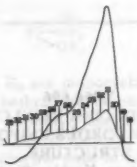
3,966,691

POLYMERIZATION OF CONJUGATED DIENES WITH STARVED LITHIUM, POTASSIUM OR SODIUM CATALYST

Adel Farhan Halasa, Bath, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 378,763, July 12, 1973, abandoned. This application Feb. 19, 1974, Ser. No. 435,395
Int. Cl.² C08D *1/20*, *3/08*
U.S. Cl. 526—78 5 Claims





1. The process of producing a cyclized aliphatic polymer of the class consisting of homopolymers of linear conjugated dienes containing 4 to 8 carbon atoms, copolymers of conjugated dienes of 4 to 8 carbon atoms and copolymers of 60 to 75 percent by weight of a conjugated diene and a vinyl aromatic monomer, which process comprises

a. cyclizing such a monomer or mixture of monomers in a monomer-starved solution in an aliphatic hydrocarbon solvent by permitting only a substantial minimum amount of unpolymerized monomer to be present during the polymerization,

b. at a temperature of 0° to 300° F.,

c. in a concentration of 5–80 percent of monomer

d. while feeding the monomer or mixtures of monomers to a polymerization vessel at the rate of substantially 0.5 to 10 pounds per hour,

e. providing for the monomer or monomers a residence time of 0.5 to 20 hours in the reactor,

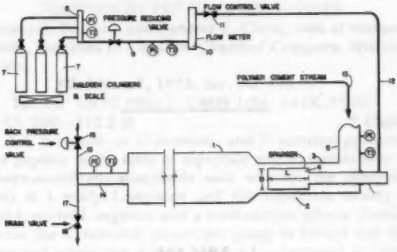
f. using as catalyst, per 100 grams of monomer, 5 to 200 millimoles of metallic lithium, sodium or potassium or an alkyl or aryl derivative thereof in which the alkyl group contains 1 to 8 carbon atoms and the aryl group is phenyl, tolyl or naphthyl together, with 5 to 200 millimoles of tetraalkyl alkylene diamine as co-catalyst.

3,966,692

PROCESS FOR HALOGENATING RUBBER

Richard E. Driscoll, and Hugh E. Milligan, both of Monroe, La., assignors to Cities Service Company, Tulsa, Okla.

Filed June 10, 1974, Ser. No. 477,726
Int. Cl.² C08F *8/22*
U.S. Cl. 526—20 10 Claims



1. In a process for halogenating an elastomer wherein a halogen is incorporated into a solution of the elastomer in an organic solvent and reaction of the halogen with the elastomer occurs while both are dissolved in the solvent, the improvement which comprises mixing a fluid halogen with a continuously flowing stream of the elastomer solution and followed by reaction of said halogen with the elastomer of said stream, the Reynold's number of said stream being below 100 during mixing of the halogen and the reaction thereof with the dissolved elastomer in the stream, and wherein a pressure is maintained on said stream which assures substantially complete disolution of the halogen therein during mixing and reaction while also preventing vaporization of volatile components of said stream during reaction of the halogen with the rubber.

3,966,693

METHOD OF AND APPARATUS FOR CONTINUOUSLY PREPARING A SYRUP OF A MONOMER-POLYMER MIXTURE

Tetsuji Kato, Otake, Japan, assignor to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jan. 17, 1974, Ser. No. 434,064

Claims priority, application Japan, Jan. 18, 1973, 48-8161

Int. Cl.² C08F *120/14, 220/14*

U.S. Cl. 526—75 2 Claims

1. A method for continuously preparing a syrup/initiator mixture used for manufacture of different kinds of plates by continuously introducing said mixture to a feeding entrance formed by continuously traveling belt spans defining a continuously traveling polymerizing space, said mixture consisting essentially of a major amount of a first supply prepared by partial polymerization of a monomer mixture of at least 80% by weight of methyl methacrylate and not more than 20% of a copolymerization unsaturated monomer selected from the class consisting of monoethylenically unsaturated compounds and polyfunctional compounds, mixed with minor amounts of a second supply, the proportions of said first and second supply being required to differ for the manufacture of the different kinds of plates; said second supply being selected from the class consisting of methyl methacrylate containing said initiator and said monomer mixture containing said initiator said mixture being continuously prepared by said first and second supplies being formed into continuous flows which are continuously intermixed and continuously introduced as said mixture to said feeding entrance, the flow rates of said flows being proportioned as required to provide the prepared mixture for one kind of plate being manufactured and, for changing to the manufacture of a different kind of plate, the flow rates being changed so they are proportioned to provide the mixture for that different kind, without stopping the continuous travel of said belt spans during said changing.

3,966,694

CATIONIC WATER SOLUBLE POLYMERIC REACTION PRODUCT OF POLY(DIALLYLAMINE)-EPIHALOHYDRIN AND NITROGEN COMPOUND

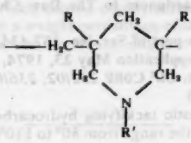
Herbert H. Espy, and Stearns T. Putnam, both of Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 334,338, Feb. 21, 1973, abandoned. This application Sept. 27, 1974, Ser. No. 509,868

Int. Cl.² C08F *126/04*

U.S. Cl. 526—11.2 9 Claims

1. A cationic water soluble resin which is essentially nonthermosetting, said resin consisting essentially of the polymeric reaction product of (1) a water soluble or water dispersible poly(diallylamine)—epihalohydrin base resin having epoxide moieties and (2) a nitrogen compound in an amount at least stoichiometrically equivalent to the epoxide moieties of the base resin, said nitrogen compound having the formula RRR′N wherein R is independently selected from the group consisting of hydrogen and C_1-C_4 alkyl and wherein R′ is selected from the group consisting of hydrogen, hydroxyl and C_1-C_4 alkyl, said reaction being carried out at a temperature of from about 0°C. to about 150°C. and until substantially all epoxide moieties of the base resin have reacted with the nitrogen compound, said base resin (1) being the reaction product of (A) a linear polymer having units of the formula



where R is hydrogen or lower alkyl, and R′ is hydrogen, alkyl or a substituted alkyl group wherein the substituent is a group which will not interfere with polymerization through a vinyl double bond and is selected from the group consisting of carboxylate, cyano, ether, amino, amide, hydrazide and hydroxyl groups and (B) from about 0.5 to about 1.5 moles of an epihalohydrin per mole of secondary plus tertiary amine present in said polymer, said product being formed at a temperature of from about 30° to about 80°C. and a pH of from about 7 to about 9.5.

3,966,695

PREVENTION OF WALL DEPOSITS DURING POLYVINYL CHLORIDE POLYMERIZATIONS

Karsten Flatau, and Bernd Terwiesch, both of Marl, Germany, assignors to Chemische Werke Huls Aktiengeselischaft, Marl, Germany

Filed Feb. 6, 1975, Ser. No. 547,608

Claims priority, application Germany, Feb. 8, 1974, 2405978

Int. Cl.² C08F *2/16, 14/06*

U.S. Cl. 526—62 14 Claims

1. In the commercial production of polyvinyl chloride and copolymers wherein vinyl chloride or a mixture of vinyl chloride and one or more vinyl monomers copolymerizable therewith is polymerized in an aqueous phase in a polymerization zone comprising metallic surfaces which are contacted by the vinyl chloride or mixture of monomers, the improvement wherein the metallic surfaces are substantially pure nickel having a purity of at least 99.0%.

3,966,696

PROCESS FOR PRODUCING VINYLCHLORIDE RESIN HAVING A HIGHLY POROUS UNIFORM GRANULAR STRUCTURE

Kunizoh Kidoh; Hidetora Kashio; Toshio Hosokawa, and Kazuo Kusida, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Mar. 6, 1975, Ser. No. 555,994

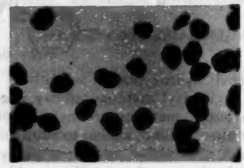
Claims priority, application Japan, Mar. 9, 1974, 49-26768

Int. Cl.² C08F *114/02;* C08L *1/28, 5/00*

U.S. Cl. 526—199 5 Claims

1. In a process for producing vinyl chloride resin having a highly porous granular structure containing little residual monomer and having a uniformly distributed grain size by suspension polymerization of vinyl chloride or a mixture of vinyl chloride and an ethylenically unsaturated monomer copolymerizable therewith, vinyl chloride being predominant, in an aqueous medium containing a suspending agent in the presence of an oil-soluble polymerization catalyst, the improvement which comprises the use of a suspending agent

comprising a protective colloid and a saccharose ester which is an ester of one mole of saccharose with from 1 to 3 mole of an aliphatic monocarboxylic acid having 8 to 18 carbon atoms, the quantity of the protective colloid being in the range



of from 0.01 to 0.5 percent by weight of said vinyl chloride monomer or said mixture and the quantity of saccharose ester being in the range of from 0.005 to 0.5 percent by weight of said vinyl chloride monomer or said mixture.

3,966,697

PRODUCTION OF HIGH-VINYL GROUP, HIGH-MOLECULAR WEIGHT UNSATURATED HYDROCARBON POLYMERS

Wolfgang Kampf, Haltern, and Karl-Heinz Nordsiek, Marl, both of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Dec. 9, 1974, Ser. No. 530,550

Claims priority, application Germany, Oct. 3, 1974, 2447203

Int. Cl.² C08F 4/70, 36/06

U.S. Cl. 526—93 **13 Claims**

1. In a process for the production of a vinyl-group containing unsaturated hydrocarbon polymer by the polymerization of a conjugated diene in the presence of a solvent, employing as catalyst system consisting essentially of (a) one or both of cobalt octoate and cobalt acetylacetonate, (b) a halogen-containing organoaluminum compound in an amount such that the molar ratio of the cobalt in (a) to the aluminum in (b) is 1:1 to 1:2,000, and (c) an organic phosphorus compound, alone or in combination with (d) an H-acidic compound in a molar ratio to the aluminum in (b) of up to 1.5 : 1, the improvement wherein component (c) is a tris(aryl)phosphite of the general formula

wherein R_1, R_2 and R_3 are monocyclic halogenated aryl or diphenyl, naphthyl, anthracenyl or phenanthryl, or a corresponding diphenyl, naphthyl, anthracenyl or phenanthryl substituted by at least one of halo and alkyl, in a molar ratio of from 0.1 to 50 moles per mole of cobalt compound.

3,966,698

RECOVERY OF TALL OIL SOAPS

Robert V. Gossage, Chicago Ridge, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed May 2, 1975, Ser. No. 574,077

Int. Cl.² C09F 1/00

U.S. Cl. 260—97.5 **22 Claims**

1. A method for the separation of tall oil soaps from Kraft black liquor in the manufacture of paper pulp which comprises the steps of:

A. Treating said Kraft black liquor with an aqueous solution of sodium lignosulfonate containing sodium hydroxide;

B. Rendering said tall oil soaps insoluble; and

C. Removing said insoluble tall oil soaps by skimming.

3,966,699

REDUCED BACITRACIN

Mohammed T. Shipchandler, Terre Haute, Ind., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Filed Feb. 7, 1975, Ser. No. 548,124

Int. Cl.² C07C 103/52; C07G 7/00

U.S. Cl. 260—112.5 R **5 Claims**

1. Reduced bacitracin and pharmaceutically acceptable salts thereof obtained by reacting bacitracin with sodium borohydride at ambient temperatures in a ratio of about 1:1 by weight and for a period of time of from about 0.5 to 1.5 hours.

3,966,700

PROCESS FOR PREPARING SYNTHETIC L-PYROGLUTAMYL-L-HISTIDYL-L-PROLINAMIDE

Gabriele Mattalia, Rome, Italy, assignor to Istituto Farmacologico Serono, S.P.A., Rome, Italy

Filed Sept. 27, 1974, Ser. No. 509,843

Claims priority, application Italy, Oct. 19, 1973, 53232/73

Int. Cl.² C07C 103/52; C07G 7/00

U.S. Cl. 260—112.5 TR **9 Claims**

1. In a process for preparing highly pure pyroglutamyl-histidyl-prolinamide by synthesis from protected aminoacids, removal of the protecting groups, and final purification of the crude deprotected tripeptide, the improvement which comprises reductively deprotecting the protected tripeptide pyroglutamyl-N^{im}-benzyl-histidyl-prolinamide by contact thereof with sodium in liquid ammonia, and purifying the crude deprotected tripeptide by gel filtration.

3,966,701

FIBRINOGEN PEPTIDE DERIVATIVES

Linneaus C. Dorman, and Roberta C. Cheng, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 7, 1973, Ser. No. 413,745

Int. Cl.² C07C 103/52; C08H 1/00; A61K 37/00

U.S. Cl. 260—112.5 R **7 Claims**

1. A C-terminal- or C-terminal- and N-terminal-protected lower peptide of the class of dipeptide and tripeptide salts of a pharmaceutically-acceptable acid wherein the dipeptide moiety is L-prolyl-L-arginine and the tripeptide moiety is glycyl-L-prolyl-L-arginine and a methanolate solvate thereof, wherein the C-terminal protective group is benzyl and the N-terminal protective group is benzyloxycarbonyl or tert.-butyloxycarbonyl.

3,966,702

PROCESS FOR THE PRODUCTION OF OILSEED ISOLATES

Paul L. Carey, St. Louis, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 379,519, July 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 246,941, April 24, 1972, abandoned. This application Nov. 22, 1974, Ser. No. 526,181

Int. Cl.² A23J 1/14

U.S. Cl. 260—123.5 **38 Claims**

1. A process for the production of a protein extract from oilseeds which is substantially devoid of impurities comprising:

a. extracting a ground substantially defatted oilseed material with an alkaline extractant to provide an alkaline protein extract having a pH of at least 8.5; and

b. passing said alkaline extract through activated carbon to substantially remove impurities from said extract.

3,966,703

ASYMMETRICAL FRISAZO DYESTUFFS DERIVED FROM DIAZOTIZED 2,7-DIAMINO-CARBAZOLE

Wolf-Eckhard Bleck; Horst Nickel, both of Leverkusen, and Karl-Heinz Schundehutte, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

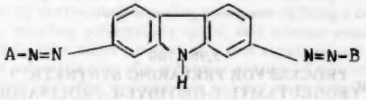
Filed July 20, 1973, Ser. No. 381,167

Claims priority, application Germany, July 21, 1972, 2235815

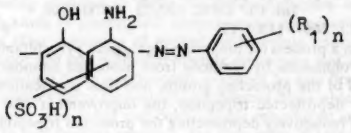
Int. Cl.[2] C09B 35/46

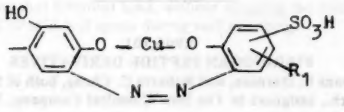
U.S. Cl. 260—146 R 7 Claims

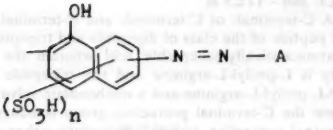
1. Azo dyestuff of the formula

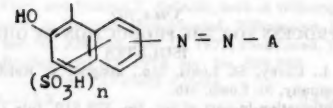


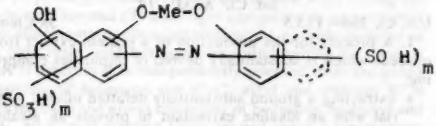
wherein B represents a radical of the formula



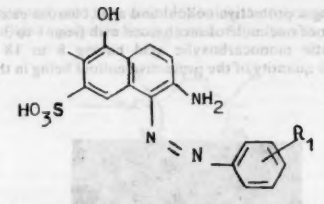








or



A is hydroxyphenyl; hydroxyphenyl substituted by methyl, ethyl, tert.-butyl, cyclohexyl, methoxy, ethoxy, phenyl, chloro, acetylamino, carboxy, methoxycarbonyl, ethoxycarbonyl, hydroxy, sulfo or nitro; anilino; anilino substituted by methyl, ethyl, propyl, butyl, chloroethyl, acetoxyethyl, hydroxyethyl, cyanoethyl, acetylamino, methoxy, ethoxy, chloro, $-NH_2$, nitro, hydroxy, sulfo, carboxymethylamino, hydroxyacetylamino, carboxycarbonylamino or aminocarbonylamino; hydroxynaphthalene; aminonaphthalene; hydroxynaphthalene or aminonaphthalene substituted by hydroxy, methoxy, ethoxy, hydroxyethoxy, methylsulfonylamino, amidosulfonyl, acetylamino, carboxy, amidocarbonyl, anilidocarbonyl, anilidocarbonyl substituted in the aniline nucleus by methyl, chlorine, methoxy or sulfo, sulfo, chloroacetylamino, propionylamino, benzoylamino, animobenzoylamino, chlorobenzoylamino, nitrobenzoylamino, benzenesulfonylamino, toluenesulfonylamino, aminocarbonylamino, phenylaminocarbonylamino, dimethylamino, phenylamino or chloro;

n is 1 or 2;

m is 0, 1 or 2;

R_1 is hydrogen, C_1–C_4-alkyl, nitro, sulfo, chloro, $-NH_2$ or acetylamino;

Me is copper, iron, nickel, cobalt or chromium.

3,966,704

NAPHTHYLAZO NAPHTHYL COPPER COMPLEX DYESTUFFS

Fritz Meininger, Frankfurt am Main; Klaus Hunger, Kelkheim, Taunus, and Hartmut Springer, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

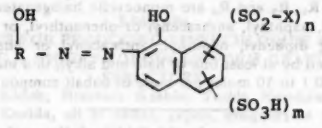
Continuation of Ser. No. 122,243, March 8, 1971, abandoned. This application Oct. 26, 1973, Ser. No. 409,813

Claims priority, application Germany, Mar. 6, 1970, 2010656

Int. Cl.[2] C09B 45/18, 45/32; D06P 3/60

U.S. Cl. 260—150 1 Claim

1. A water-soluble copper complex compound of a monoazo dyestuff which in the metal-free form and in form of the free acid corresponds to the formula



wherein

X is vinyl or $-CH_2-CH_2-Z$

in which Z is chlorine, bromine, methylsulfonyloxy, p-toluenesulfonyloxy, acetoxy, 3-sulfobenzoyloxy, phenoxy, dimethylamino, diethylamino, thiosulfato, phosphato or sulfato, *m* is 0 or 1, *n* is 1 or 2, the sum of $(m + n)$ is 1 or 2, and

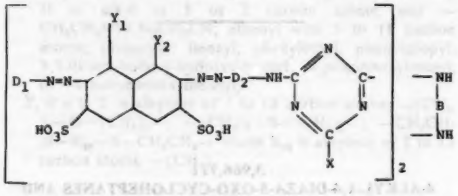
in which HO—R is naphthol or naphthol substituted by chloro, methyl, methoxy, ethoxy, amino, acetylamino, benzoylamino, chloroacetylamino, 3-(β-chloroethylsulfonyl)-benzoylamino, N-phenylsulfonyl-N-methyl-amino, hydroxy, sulfo or $-SO_2-X$ wherein X is defined as above.

3,966,705
DISULFO NAPHTHALENE CONTAINING FIBER-REACTIVE TETRAZO DYES

Fritz Oesterlein, Basel, and Henri Riat, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,420
Claims priority, application Switzerland, Jan. 4, 1974, 61/74; Oct. 22, 1974, 14103/74
Int. Cl.² C09B *43/12, 43/16*
U.S. Cl. 260—153 3 Claims

1. A fibre-reactive tetraxo dye of the formula



wherein each of D_1 and D_2 represents mono- or di-sulfophenyl which is further unsubstituted or substituted by methyl, chloro, nitro or methoxy;

one of Y_1 and Y_2 represents HO- and the other represent H_2N;

X represents halo; and

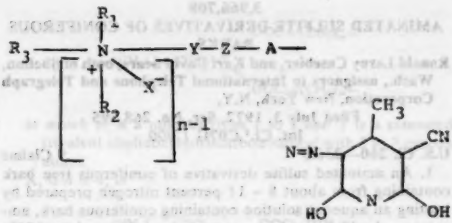
B represents phenylene which is unsubstituted or substituted by chloro, methyl, ethyl, methoxy or ethoxy.

3,966,706
2,6-DIHYDROXY-3-CYANO-4-METHYLPYRIDINE CONTAINING AZO DYES WHICH CONTAIN A FUNCTIONAL AMINO GROUP

Visvanathan Ramanathan, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 110,240, Jan. 27, 1971, which is a continuation of Ser. No. 827,960, May 26, 1969, abandoned. This application Sept. 7, 1973, Ser. No. 395,304
Int. Cl.² C07B *29/36*
U.S. Cl. 260—156 19 Claims

1. A basic azo dyestuff of the formula

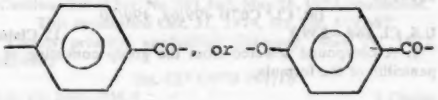


in which

A is unsubstituted or substituted phenylene, biphenylene or naphthylene which, when substituted, is substituted by one or more of halogen, alkyl, or alkoxy, or is mono-substituted by nitro, sulphonamide, phenyl, phenoxy, phenylazo, halogen alkyl, alkylsulphonyl, N-alkyl sulphonamide or carbalkoxy where in each case the alkyl radical contains at most 4 carbon atoms,

Z is a direct bond, —O—, —S—, —NR′—, —CO—, —OCO—, —NR′CO—, —NR′SO_2—, —SO_2—,

—$COOC_2H_4$—O—



where

R′ is hydrogen or lower alkyl,

Y is C_1–C_6 alkylene, C_1–C_6 alkylene interrupted by —S—, —O—, or —NH—, or with N, R_1 and R_3 or with N and R_3 forms benztriazolyl, benzimidazolyl, triazolyl or pyridyl,

R_1 and R_2 each is hydrogen, alkyl of 1 to 4 carbon atoms, phenyl, benzyl or cyclohexyl,

R_3 is hydrogen, alkyl of 1 to 4 carbon atoms, benzyl, cyclohexyl, alkoxy of 1 to 4 carbon atoms or amino,

or where one or more of R_1, R_2 and R_3 together with N forms pyridyl, piperidyl, quinolyl, morpholinyl, pyrrolidyl or cyclohexylamine,

X^- is an anion and

n is 1 or 2.

3,966,707
PROCESS FOR PREPARING DOUBLE STRANDED RNA

Ernst Boris Chain, London; Kenneth William Buck, Crawley Down; Joan Elizabeth Darbyshire, London; Geoffrey Talbot Banks, Billingshurst; Fred Himmelweit, and Giulio Ratti, both of London, all of England, assignors to Beecham Group Limited, United Kingdom

Continuation of Ser. No. 202,635, Nov. 26, 1971, abandoned, which is a division of Ser. No. 124,496, March 15, 1971, abandoned. This application Aug. 2, 1974, Ser. No. 494,334
Int. Cl.² C07C *21/02*
U.S. Cl. 260—211.5 R 6 Claims

1. A process for the production of double-stranded ribonucleic acid or the sodium salt thereof which comprises deproteinizing virus particles extracted from *Aspergillus foetidus* or *Aspergillus niger* and recovering the double-stranded ribonucleic acid or sodium salt thereof obtained.

3,966,708
AMINATED SULFITE DERIVATIVES OF CONIFEROUS BARKS

Ronald Leroy Casebier, and Karl David Sears, both of Shelton, Wash., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 3, 1972, Ser. No. 268,595
Int. Cl.[2] C07G 17/00
U.S. Cl. 260—236.5 **9 Claims**

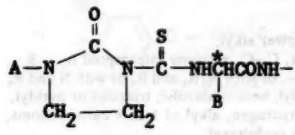
1. An aminated sulfite derivative of coniferous tree bark containing from about 8 – 11 percent nitrogen prepared by heating an aqueous solution containing coniferous bark, ammonia and sulfur dioxide at a temperature of from about 130°–190°C, the ammonia:bark ratio being from about 0.5:1 – 0.9:1 and the SO_2:bark ratio being about 0.3:1 – 0.35:1 both on a weight basis, and separating the resulting aqueous bark derivative from the reaction mass.

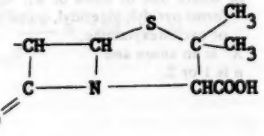
3,966,709
PENICILLINS AND CEPHALOSPORINS AND THEIR PRODUCTION

Hans-Bodo König; Karl Georg Metzger, and Wilfried Schröck, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Oct. 25, 1974, Ser. No. 518,178
Claims priority, application Germany, Oct. 30, 1973, 2354219
Int. Cl.[2] C07D 499/68, 499/70
U.S. Cl. 260—239.1 **12 Claims**

1. A compound selected from the group consisting of a penicillin of the formula:





and the pharmaceutically acceptable acid addition salts thereof wherein

the carbon atom designated C constitutes a center of chirality;

A is hydrogen or alkyl of 1 to 4 carbon atoms; and

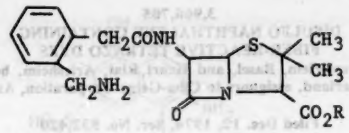
B is phenyl, methylphenyl, chlorophenyl, hydroxyphenyl or cyclohexa-1,4-dien-1-yl.

3,966,710
AMINOMETHYLARYLMETHYLPENICILLIN DERIVATIVES

James W. McFarland, Lyme, and Colin Thomson, Groton, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Nov. 12, 1974, Ser. No. 523,024
Int. Cl.[2] C07D 499/68
U.S. Cl. 260—239.1 **7 Claims**

1. A compound selected from the group consisting of:



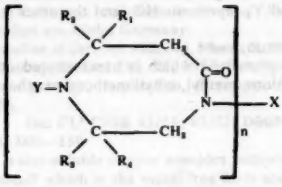
and the pharmaceutically acceptable salts thereof wherein R is selected from the group consisting of hydrogen, 1-(alkanoyloxy) alkyl, said alkanoyl having 2 to 8 carbon atoms and said alkyl having from 1 to 3 carbon atoms, and phthalidyl.

3,966,711
4-ALKYL-1,4-DIAZA-5-OXO-CYCLOHEPTANES AND THEIR 1-OXYLS

Michael Rasberger, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 5, 1974, Ser. No. 476,366
Claims priority, application Switzerland, June 22, 1973, 9186/73
Int. Cl.[2] C07D 243/06
U.S. Cl. 260—239.3 R **9 Claims**

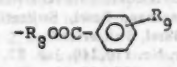
1. A compound of the Formula



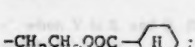
(I)

wherein R_1, R_2, R_3 and R_4 independently of one another are alkyl of 1 to 18 carbon atoms or R_1 and R_2 and/or R_3 and R_4 together with the carbon atom to which they are bonded form a cyclopentyl, cyclohexyl or cyclooctyl ring, Y is hydrogen or the oxyl radical 0°, n is an integer from 1 to 4; and

X, if n is 1, is alkyl of 1 to 20 carbon atoms; or an alkyl and/or alkylene containing substituent selected from hydroxyalkyl of 1 to 3 carbon atoms; $—CH_2COOH$; $—CH_2COOR_5$ where R_5 is alkyl of 1 to 18 carbon atoms; $—R_6OOCR_7$ where R_6 is alkylene of 2 or 3 carbon atoms and R_7 is alkyl of 1 to 17 carbon atoms;



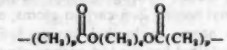
wherein R_8 is alkylene of 2 or 3 carbon atoms and R_9 is tert.C_4H_9;



—$R_{10}NHCOR_{11}$ where R_{10} is alkylene of 2 or 3 carbon atoms and R_{11} is alkyl of 1 to 17 carbon atoms; —CH_2CONH_2; —$CH_2CH_2CONH_2$; —$R_{12}CONHR_{13}$ where R_{12} is alkylene of 1 or 2 carbon atoms and R_{13} is alkyl of 1 to 12 carbon atoms; —$CH_2CH_2CONHC_6H_5$; —$CH_2CON(CH_3)_2$; —CH_2CN or —CH_2CH_2CN; —$R_{14}OR_{15}$ where R_{14} is alkylene of 1 or 2 carbon atoms and R_{15} is alkyl of 4 to 8 carbon atoms; —$R_{16}SR_{17}$ where R_{16} is alkylene of 2 or 3 carbon atoms and R_{17} is octyl or phenyl; —$CH_2CH_2SOR_{18}$ where R_{18} is octyl; —$CH_2CH_2CH_2SO_2R_{19}$ where R_{19} is dodecyl; —$R_{20}N(R_{21})$ 2 where R_{20} is alkylene of 2 or 3 carbon atoms and R_{21} is independently H or alkyl of 1 or 2 carbon atoms; and —$CH_2CH_2NHCH_2CH_2CN$; alkenyl with 3 to 18 carbon atoms; propargyl; benzyl; phenylethyl; phenylpropyl; 3,5-di-tert-butyl-4-hydroxy-benzyl; 4-propionoxybenzyl; or 4-ethoxycarbonylbenzyl;

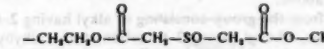
X, if *n* is 2, is alkylene of 1 to 18 carbon atoms; —$(CH_2)_2$—O—$(CH_2)_2$—; —$(CH_2)_2$—S—$(CH_2)_2$—; —CH_2CH_2—S—R_{22}—S—CH_2CH_2— where R_{22} is alkylene of 2 to 12 carbon atoms; —$(CH_2)_p$

where *p* is 2 or 3 and R_{23} is H, CH_3, C_2H_5 or CH_2CH_2CN;

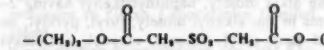


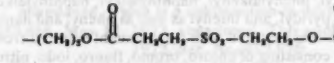
where *p* is an integer from 1 to 3 and *q* is an integer from 2 to 12;

where R_{24} is butylene; —CH_2—O—CH_2—, —CH_2—S—CH_2— or —$(CH_2)_2S(CH_2)_2$—; —$(CH_2)_pCONH(CH_2)_qNHCO(CH_2)_p$— where *p* is an integer from 1 to 3 and *q* is an integer from 2 to 12; —$(CH_2)_2$—SO—$(CH_2)_2$—; —CH_2CH_2—SO—$(CH_2)_q$—SO—CH_2CH_2— where *q* is an integer from 2 to 12;



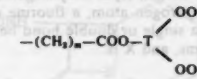
—CH_2—CH_2SO_2—CH_2—CH_2—; —CH_2CH_2—SO_2—$(CH_2)_6$—SO_2—CH_2CH_2—;





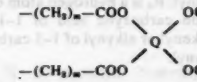
alkenylene or alkinylene with 4 to 6 carbon atoms; 1,2-bis-(methylene)-benzene; 1,3-bis-(methylene)-benzene; 1,4-bis-(methylene)-benzene; 1,2-bis-(ethylene) -benzene; 1,3-bis,(ethylene)-benzene; 1,4-bis-(ethylene)-benzene; or 4,4'-bis-(methylene)-diphenyl;

X, if *n* is 3, is the group



in which *m* is a number from 1 to 2 and T is a saturated trivalent aliphatic hydrocarbon radical with 3 to 7 carbon atoms;

X, if *n* is 4, is



in which *m* is a number from 1 to 2 and Q is a saturated tetravalent aliphatic hydrocarbon radical with 4 or 5 carbon atoms; and its salts with carboxylic acids or organophosphorus acids with 1 to 20 carbon atoms, phosphoric acid, hydrochloric acid, phosphorous acid or carbonic acid.

3,966,712

PROCESS FOR THE PURIFICATION OF CAPROLACTAM

Otto Immel, and Hans-Helmut Schwarz, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 361,465, May 18, 1973, abandoned. This application Oct. 31, 1974, Ser. No. 519,687

Claims priority, application Germany, May 19, 1972, 2224505

Int. Cl.² C07D *201/16*

U.S. Cl. 260—239.3 A **3 Claims**

1. A process for purification of caprolactam comprising the steps of crystallization followed by distillation wherein said caprolactam has been obtained by catalytic rearrangement in the gaseous phase and contains as main impurities a member of the group consisting of cyclohexanone oxime, cyclohexanone, cyclohexanol, various hexenic acid nitriles and cracking products and said crystallisation takes place from dimethyl formamide, tetrahydrofuran, 1,4-dioxane, propanol, butanol, amylalcohol or from a mixture of these solvents.

3,966,713

11 β-FLUOROANDROSTENES

Helmut Hofmeister; Henry Laurent; Rudolf Wiechert; Klaus Annen, and Hermann Steinbeck, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

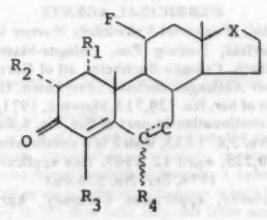
Filed Feb. 25, 1975, Ser. No. 552,958

Claims priority, application Germany, Mar. 1, 1974, 2410443

Int. Cl.² C07C *3/00*

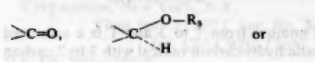
U.S. Cl. 260—239.55 R **38 Claims**

1. A 11β-fluoroandrostene of the formula



wherein R_1 and R_2 each are a hydrogen atom or collectively are methylene or a further carbon-to-carbon bond between

the C-1 and C-2 carbon atoms; R_3 is a hydrogen atom or a chlorine atom, R_4 is a hydrogen atom, a fluorine atom or a chlorine atom, C C is a single or double bond between the C-6 and C-7 carbon atoms, and X is



wherein R_5 is a hydrogen atom, the acyl radical of a hydrocarbon carboxylic acid of 1–18 carbon atoms, alkyl of 1–4 carbon atoms, or tetrahydropyranyl; R_6 is a hydrogen atom or the acyl radical of a hydrocarbon carboxylic acid of 1–18 carbon atoms, and R_7 is alkyl, alkenyl or alkynyl of 1–5 carbon atoms, butadiynyl or chloroethynyl.

3,966,714

PROCESS FOR THE PREPARATION OF A Δ^4-3-KETO STEROID 17-PROPIOLACTONE

Rainer Philippson, Bergkamen, Germany, assignor to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed May 23, 1974, Ser. No. 472,739

Claims priority, application Germany, May 25, 1973, 2327448

Int. Cl.² C07J *19/00, 1/00*

U.S. Cl. 260—239.57 **10 Claims**

1. A process for the production of 3(17β-hydroxy-4-androsten-3-on-17α-yl)-propiolactone, which comprises the steps of

a. reacting 4-androstene-3,17dione, 1,4-androstadiene-3,17-dione, or a mixture thereof, with propargyl alcohol in the presence of an alkali alcoholate of a tertiary alcohol;

b. selectively hydrogenating the thus-produced 17α-(3-hydroxypropinyl)-17β-hydroxy-3-ketoandrost-4-ene, -androsta-1,4-diene, or mixture thereof, respectively, with hydrogen in the presence as catalyst of a complex of a halide of a metal of subgroup VIII of the periodic table with triphenyl phosphine or titanium chloride; and

c. oxidizing the thus-produced 17α-(3-hydroxy-propyl)-17-hydroxy-3-ketoandrost-4ene with chromic acid.

8. A process according to claim 7 wherein the compound which is hydrogenated is 17α-(3-hydroxypropinyl)-17β-hydroxy-4-androstene-3-one.

3,966,715

HERBICIDAL AGENTS

Kurt Westphal, Wuppertal-Vohwinkel; Werner Meiser, Wuppertal-Elberfeld; Ludwig Eue, Cologne-Stammheim, and Helmuth Hack, Cologne-Buchheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

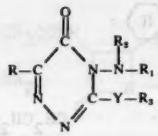
Continuation of Ser. No. 120,713, March 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 6,647, Jan. 28, 1970, Pat. No. 3,671,523, which is a continuation-in-part of Ser. No. 630,225, April 12, 1967. This application Nov. 25, 1974, Ser. No. 526,663

Claims priority, application Germany, Apr. 16, 1966, 48954451

Int. Cl.² C07D *251/10*

U.S. Cl. 260—240 A **11 Claims**

1. Substituted 1,2,4-triazine-5-one having the formula



in which Y is selected from the group consisting of O and S, and (a') when Y is O,

R is selected from the group consisting of alkyl having 1–6 carbon atoms, alkenyl having 2–6 carbon atoms, alkynyl having 2–6 carbon atoms, cycloalkyl having 5–6 ring carbon atoms, phenyl alkyl having 1–4 carbon atoms in the alkyl moiety, phenylalkenyl having 2–4 carbon atoms in the alkenyl moiety, naphthylalkyl having 1–4 carbon atoms in the alkyl moiety, naphthyl alkenyl having 2–4 carbon atoms in the alkenyl moiety, phenyl, naphthyl, furyl, pyridyl, and thienyl, and such alkyl, alkenyl, alkynyl, cycloalkyl, phenylalkyl, phenyalkenyl, naphthylalkyl, naphthylalkenyl, phenyl, naphthyl, furyl, pyridyl and thienyl which is substituted with a substituent selected from the group consisting of chloro, bromo, fluoro, iodo, nitro, carboalkoxy having 1–4 carbon atoms, alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms, phenyl-alkylmercapto having 1–4 carbon atoms in the alkyl moiety, alkylmercapto having 1–4 carbon atoms, phenylmercapto, naphthylmercapto, phenyloxy, naphthyloxy, and mixtures of such substituents,

R_1 and R_2 taken together represent a member selected from the group consisting of alkylidene having 1–4 carbon atoms and cycloalkylidene having 5–6 ring carbon atoms substituted with a substituent selected from the group consisting of furyl, nitrofuryl and pyridyl, and

R_3 is selected from the group consisting of alkanoyl having 1–4 carbon atoms, hydrogen, alkyl having 1–6 carbon atoms, alkenyl having 2–6 carbon atoms, alkynyl having 2–6 carbon atoms cycloalkyl having 5–6 ring carbon atoms, phenylalkyl having 1–4 carbon atoms in the alkyl moiety, phenylalkenyl having 2–4 carbon atoms in the alkenyl moiety, naphthylalkyl having 1–4 carbon atoms in the alkyl moiety, naphthylalkenyl having 2–4 carbon atoms in the alkenyl moiety, phenyl, naphthyl, and such alkyl, alkenyl, alkynyl, cycloalkyl, phenyl alkyl, phenyalkenyl, naphthylalkyl, naphthylalkenyl, phenyl and naphthyl which is substituted with a substituent selected from the group consisting of chloro, bromo, fluoro, iodo, amino, alkyl amino having 1–4 carbon atoms in the alkyl moiety, dialkyl amino having 1–4 carbon atoms in each alkyl moiety, nitro, alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms, phenyloxy, naphthyloxy, and mixtures of such substituents;

b'. when Y is S, and R_1, R_2 and R_3 are the same as defined under (a') above,

R is selected from the group consisting of alkyl having 2–6 carbon atoms, alkenyl having 2–6 carbon atoms, alkynyl having 2–6 carbon atoms, cycloalkyl having 5–6 ring carbon atoms, phenylalkyl having 1–4 carbon atoms in the alkyl moiety, phenylalkenyl having 2–4 carbon atoms in the alkenyl moiety, naphthylalkyl having 1–4 carbon atoms in the alkyl moiety, naphthylalkenyl having 2–4 carbon atoms in the alkenyl moiety, furyl, pyridyl, and thienyl, and such alkyl, alkenyl, alkynyl, cycloalkyl, phenylalkyl, phenylalkenyl, naphthylalkyl, naphthylalkenyl, furyl, pyridyl, and thienyl as well as phenyl and naphthyl which is substituted with a substituent selected from the group consisting of chloro, bromo, fluoro, iodo, nitro, carboalkoxy having 1–5 carbon atoms, alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms, phenyl-alkylmercapto having 1–4 carbon atoms in the alkyl moiety, alkylmercapto having 1–4 carbon atoms, phenyl mercapto, naphthylmercapto, phenyloxy, naphthyloxy, and mixtures of such substituents;

c'. when Y is S, and R, R_1 and R_2 are the same as defined under (a') above,

R_3 is selected from the group consisting of alkyl having 2–6 carbon atoms, alkenyl having 2–6 carbon atoms, alkynyl having 2–6 carbon atoms, cycloalkyl having 5–6 ring carbon atoms, phenylalkyl having 1–4 carbon atoms in the alkyl moiety, phenylalkenyl having 2–4 carbon atoms in the alkenyl moiety, naphthylalkyl having 1–4 carbon atoms in the alkyl moiety, naphthylalkenyl having 2–4 carbon atoms in the alkenyl moiety, phenyl, naphthyl, and such alkyl, alkenyl, alkynyl, cycloalkyl, phenylalkyl, phenylalkenyl, naphthylalkyl, naphthylkenyl, phenyl and naphthyl which is substituted with a substituent selected from the group consisting of chloro, bromo, fluoro, iodo, amino, alkylamino having 1–4 carbon atoms in the alkyl moiety, dialkylamino having 1–4 carbon atoms in each alkyl moiety, nitro, alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms, phenyloxy, naphthyloxy, and mixtures of such substituents;

d'. when Y is S, and R and R_3 are the same as defined under (a') above,

R_1 and R_2 taken together represent a member selected from the group consisting of alkylidene having 1–4 carbon atoms, cycloalkylidene having 5–6 ring carbon atoms, phenylalkylidene having 2–4 carbon atoms in the alkylidene moiety and naphthylalkylidene having 2–4 carbon atoms in the alkylidene moiety substituted with a substituent selected from the group consisting of furyl, nitrofuryl and pyridyl.

3,966,716

2H-1,3,2-DIOXABORINO-[5,4-c]-1,2-BENZO-THIAZINE 6,6-DIOXIDES

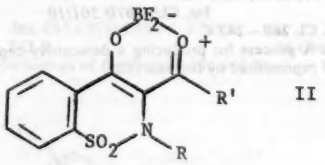
Daniel Kaminsky, Parsippany, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 365,398, May 29, 1973, Pat. No. 3,898,218. This application Mar. 17, 1975, Ser. No. 558,866

Int. Cl.² C07D *279/02*

U.S. Cl. 260—243 R **7 Claims**

1. A compound of the formula II:



II

wherein R represents hydrogen, lower alkyl and lower alkanoyl; R' represents lower alkyl.

3,966,717

7-β-ACYLAMIDO-3-CARBAMOYLOXYMETHYLCEPH-3-EM-4-CARBOXYLIC ACIDS AND SALTS THEREOF

Martin Christopher Cook; Gordon Ian Gregory, both of Chalfont St. Peter, and Janice Bradshaw, Harrow, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

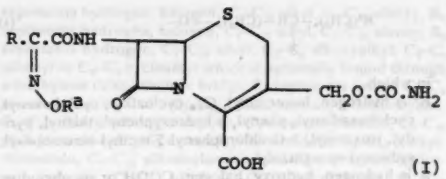
Continuation-in-part of Ser. No. 304,524, Nov. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 252,666, May 12, 1972, abandoned. This application Nov. 8, 1973, Ser. No. 413,970

Claims priority, application United Kingdom, May 14, 1971, 15082/71; Oct. 1, 1971, 45884/71; Aug. 21, 1973, 39645/73

Int. Cl.² C07D *501/20*

U.S. Cl. 260—243 C **1 Claim**

1. A compound selected from the group consisting of a cephalosporin antibiotic of the formula



(I)

wherein R is pyrrolyl; N-methylpyrrolyl; isothiazolyl; thiadiazolyl; oxadiazolyl; 3- or 4-isoxazolyl; 3-phenyl-5-methylisoxazol-4-yl or 3-halophenyl-5-methylisoxazol-4-yl; and R^a is C_{1-4} alkyl, C_{3-7} cycloalkyl or phenyl; and a physiologically acceptable salt thereof, said cephalosporin antibiotic being in the form of a syn isomer free of the corresponding anti isomer to the extent of at least 75%.

3,966,718

7-β-ACYLAMINO-CEPH-3-EMS AND SALTS AND ESTERS THEREFOR

Edward George Brain, Leigh, Nr. Reigate, and Neal Frederick Osborne, West Croydon, both of England, assignors to Beecham Group Limited, Great Britain

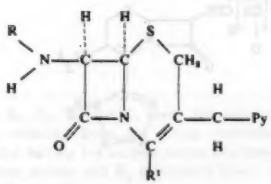
Filed Jan. 17, 1974, Ser. No. 434,137

Claims priority, application United Kingdom, Jan. 18, 1973, 2561/73

Int. Cl.² C07D *501/50, 501/52, 501/54, 501/56*

U.S. Cl. 260—243 C **9 Claims**

1. A 7-β-acylamino-ceph-3-em compound of the formula (II):



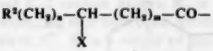
(II)

or a pharmaceutically acceptable acid addition salt thereof, wherein

Py is 2-pyridyl or 3-pyridyl,

R^1 is COOH, a salt of COOH selected from the sodium, potassium, calcium, magnesium, aluminum, triethylamine, procaine, dibenzylamine, triethanolamine, 1-ephenamine and ethylpiperidine or a hydrolyzable ester which breaks down in the body to the free acid selected from acetoxymethyl, pivaloyloxymethyl, α-acetoxymethyl, α-acetoxybenzyl, α-pivaloyloxyethyl, phthalide, and 3,4 dimethyl phthalide

R is



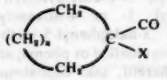
(i)

in which

R^2 is hydrogen, lower alkyl, C_{3-6} cycloalkyl, cyclohexenyl, cyclohexadienyl, phenyl, p-hydroxyphenyl, thienyl, pyridyl, isoxazolyl, 3-O-chlorophenyl-5-methyl-isoxazol-4-yl, sydnonyl or tetrazolyl,

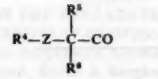
X is hydrogen, hydroxy, halogen, COOH or its phenyl or indanyl ester, azido, amino, ureido, guanidino, triazolyl, tetrazolyl, cyano, formyloxy, lower alkanoyloxy or lower alkoxy; and

n and *m* are each 0, 1, 2 or 3; or



(ii)

in which *n* is 1, 2, 3 or 4 and X is as defined in (i) above, or



(iii)

in which

R^4 is lower alkyl, benzyl, phenyl, C_{3-6} cycloalkyl, cyclohexenyl, cyclohexadienyl, thienyl or pyridyl,

R^5 and R^6 are each hydrogen, lower alkyl, phenyl, benzyl or phenylethyl, and

Z is oxygen or sulphur.

3,966,719

4-(TETRAZOL-5-YL)-Δ³-CEPHEM COMPOUNDS

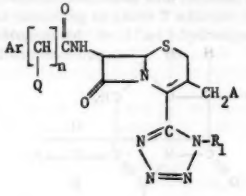
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 407,097, Oct. 17, 1973, abandoned. This application Sept. 23, 1974, Ser. No. 508,634

Int. Cl.² C07D *501/20*

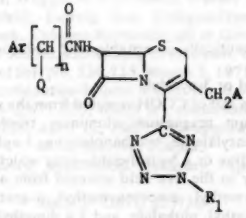
U.S. Cl. 260—243 C **8 Claims**

1. A compound selected from the group consisting of



III

and



IV

and the salts thereof, wherein

Ar is selected from the group consisting of cyano, bromo, phenyl, mono- and disubstituted phenyl wherein each substituent is selected from the group consisting of hydroxy, fluoro, chloro, bromo, amino, methoxy and methyl, 2-methyl-1,3,4-thiadiazol-5-ylthio, phenoxy, phenylthio, thienyl and 1-tetrazolyl and pyridylthio;

Q is selected from the group consisting of hydrogen, hydroxy, azido, amino and carboxy;

n is an integer of 1;

A is selected from the group consisting of hydrogen, acetoxy, 1-methyltetrazol-5-ylthio and 2-methyl-1,3,4-thiadiazol-5-ylthio;

R_1 is selected from the group consisting of hydrogen, alkanoyloxymethyl having from three to six carbon atoms, 1-(alkanoyloxy)ethyl having from four to seven carbon atoms, methoxymethyl, and phthalidyl; provided that when Ar is selected from the group consisting of pyridylthio, phenoxy, phenylthio, 2-methyl-1,3,4-thiadiazol-5-ylthio, bromo, and cyano, Q is selected from the group consisting of hydrogen and carboxy.

3,966,720

PROCESS FOR PRODUCING DESACETOXY CEPHALOSPORANIC ACID COMPOUND

Tatsuo Tomioka, Tokyo; Yasuo Hoshide, Okegawa; Hiroshi Ogawa, Ageo, and Kenichi Suzuki, Funabashi, all of Japan, assignors to Nikken Chemicals Co., Ltd., Tokyo, Japan

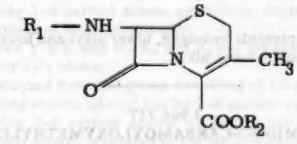
Filed Dec. 10, 1973, Ser. No. 423,187

Claims priority, application Japan, Dec. 9, 1972, 47-123830; Dec. 12, 1972, 47-125958; Dec. 27, 1972, 48-1594; Mar. 9, 1973, 48-27729

Int. Cl.² C07D *501/10*

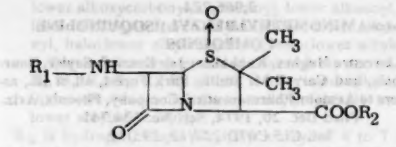
U.S. Cl. 260—243 C **14 Claims**

1. A process for producing a desacetoxy cephalosporanic acid represented by formula (III),



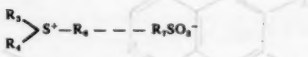
(III)

wherein R_1 is acyl, selected from the group consisting of 2-phenylacetyl, phenoxyacetyl, 2-phenoxybutyryl, 2-carboxy-2-phenylacetyl, 2,6-dimethoxybenzoyl, 2-ethoxy-1-naphthoyl, 2-sulfo-2-phenylacetyl, 2-azido-2-phenylacetyl, 2-thienylacetyl, 2-amino-2-phenylacetyl, and R_2 is alkyl selected from the group consisting of t-butyl and 2,2,2-trichloroethyl or arylalkyl selected from the group consisting of benzyl, p-methoxybenzyl, p-nitrobenzyl, benzhydryl, trityl and phenacyl consisting essentially of heating a penicillin sulfoxide of the formula (I),



(I)

wherein R_1 and R_2 are the same as hereinbefore defined, at 80° to 130°C for at least one hour in an inert organic solvent selected from the group consisting of 1,4-dioxane, n-propyl ether, methyl n-propyl ketone, methyl isobutyl ketone, ethyl carbonate, n-propyl acetate, 1,2-dichloropropane and 1,1,2-trichloroethane in the presence of 0.1 to 4 mole per one mole of said penicillin sulfoxide of a sulfonate represented by formula (VI),



(VI)

wherein R_3, R_4 and R_6 are lower alkyl, phenyl, benzyl, phenylethyl, R_7 is 1-12C alkyl, phenyl 1-12C alkyl-substituted phenyl, naphthyl, 1-12C alkyl-substituted naphthyl, halogen-substituted phenyl, and wherein R_3 and R_4 may bond to form a 4-5C heterocyclic polymethylene ring and R_6 and R_7 may bond to form a polymethylene link and wherein the sulfonate anion of said compound is selected from the group consisting of methanesulfonate, ethanesulfonate, propanesulfonate, benzenesulfonate, p-toluenesulfonate, trimethylbenzenesulfonate, dodecylbenzenesulfonate, chlorobenzenesulfonate and naphthalenesulfonate.

3,966,721

OXA- AND THIA-DIAZIN-2-ONES

Roger K. Huff, Wokingham, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

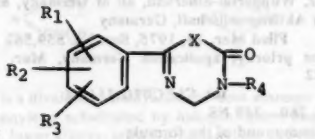
Filed Dec. 13, 1974, Ser. No. 532,433

Claims priority, application Switzerland, Dec. 19, 1973, 17810/73

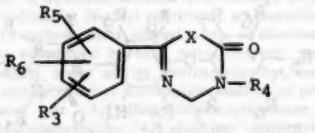
Int. Cl.² C07D *285/34, 273/04*

U.S. Cl. 260—243 R **16 Claims**

1. Diazine derivatives of the formulae Ia and Ib



(Ia)



(Ib)

wherein X represents oxygen or sulphur, R_1 represents hydrogen, halogen, nitro, cyano, C_1–C_{12} alkyl, C_1–C_{12} alkoxy, C_1–C_{12} haloalkyl, C_1–C_{12}haloalkoxy, C_2–C_4 alkenyl, C_2–C_4 alkenyloxy, C_1–C_{12} alkylthio, C_1–C_{12}haloalkylthio, C_2–C_4–haloalkenyloxy, C_1–C_{12} alkoxycarbonyl, C_1–C_{12} alkylsulphonyl, C_1–C_{12} haloalkylsulphonyl, 4-nitrophenoxy, R_2 represents hydrogen, halogen, nitro, C_1–C_{12} alkyl, C_1–C_{12} alkoxy, R_3 represents hydrogen, halogen, C_1–C_{12} alkyl, c_1–C_{12} alkoxy, R_5 represents hydrogen, halogen, C_1–C_{12} alkyl, C_1–C_{12} alkoxy, R_4 represents hydrogen, C_1–C_{12} alkyl, C_2–C_5 alkoxyalkyl, C_2–C_4 alkenyl or C_3–C_6 cycloalkyl which is optionally bound through a methylene or an ethylene bridge, R_5 represents amino, C_1–C_5 monoalkylamino or C_2–C_{10} dialkylamino, isothiocyano, C_1–C_{12} alkoxycarbonylamino, C_2–C_4 monoalkylureido, C_3–C_{10} dialkylureido or C_2–C_6 monoalkylthioureido or C_3–C_{10} dialkylthioureido, C_1–C_{12} alkanoylamino, and R_6 represents hydrogen, halogen, C_1–C_{12} alkyl, C_1–C_{12} alkoxy, cyano, C_1–C_{12} haloalkyl, C_2–C_4 alkenyl, C_3–C_4 alkenyloxy, C_2–C_4 haloalkenyloxy, C_1–C_{12} alkoxycarbonyl, C_1–C_{12} alkylsulphonyl.

3,966,722

INDAMINES FOR DYEING KERATINOUS FIBERS

Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 161,887, July 12, 1971, Pat. No. 3,758,268, which is a continuation-in-part of Ser. No. 52,739, July 6, 1970, Pat. No. 3,677,690. This application May 16, 1973, Ser. No. 360,741

Claims priority, application France, July 17, 1969, 69.59119; July 17, 1970, 70.61354; Jan. 15, 1971, 71.62429; Jan. 15, 1971, 71.62429

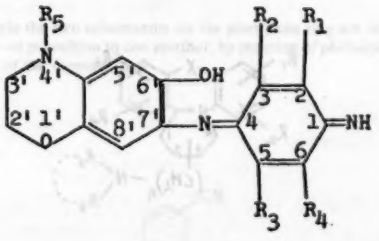
The portion of the term of this patent subsequent to July 31, 1990, has been disclaimed.

Int. Cl.² C07D *265/00, 273/00, 295/00*

U.S. Cl. 260—244 R **15 Claims**

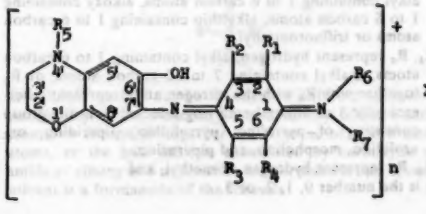
1. A compound selected from the group consisting of

1. an indamine having the formula



wherein R_1, R_2, R_3 and R_4 each, independently, represent a member selected from the group consisting of hydrogen, lower alkyl having 1-4 carbon atoms and lower alkoxy having 1-4 carbon atoms and R_5 represents lower alkyl having 1-4 carbon atoms, and

2. an indamine salt having the formula



wherein R_1, R_2, R_3 and R_4 have the meanings given above, R_5 represents a member selected from the group consisting of hydrogen and lower alkyl having 1-4 carbon atoms, R_6 and R_7 each independently represent a member selected from the group consisting of hydrogen, lower alkyl having 1-4 carbon atoms, hydroxy lower alkyl having 1-4 carbon atoms, acylaminoalkyl wherein the alkyl moiety has 1-4 carbon atoms and piperidinoalkyl wherein the alkyl moiety has 1-4 carbon atoms, X^{a-} is an anion selected from the group consisting of $CH_3CO_2^-$, $(Cl_3Zn)^-$ and $S_2O_8^{--}$ and n is 1-2.

3,966,723

1,2,3,4,10,14B-HEXAHYDRO-PYRIDINO[1,2-A]-DIBENZO[C,F]-AZEPINE

Willem Jacob van der Burg, Heesch, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

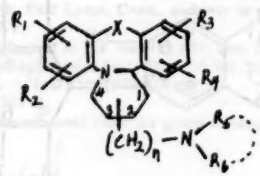
Filed Apr. 24, 1974, Ser. No. 463,712

Claims priority, application Netherlands, Apr. 26, 1973, 7305811

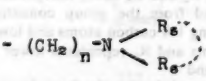
Int. Cl.² C07D *471/00*

U.S. Cl. 260—247.1 L **4 Claims**

2. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein the group



is present at position 2 or 3 and in which:

X represents the group CR_8R_9,

R_1, R_2, R_3 and R_4 represent hydrogen, hydroxy, halogen, alkyl containing 1 to 6 carbon atoms, alkoxy containing 1 to 6 carbon atoms, alkylthio containing 1 to 6 carbon atoms or trifluoromethyl,

R_5, R_6 represent hydrogen, alkyl containing 1 to 6 carbon atoms, aralkyl containing 7 to 10 carbon atoms, or R_5 together with R_6 with the nitrogen atom represent a heterocyclic 5 or 6 membered ring selected from the group consisting of pyrrolino, pyrrolidino, piperidino, oxazolidino, morpholino, and piperazino,

R_8, R_9 represent hydrogen or methyl, and

n is the number 0, 1, 2, or 3.

3,966,724

1-(α-AMINOMETHYLBENZYL)ISOQUINOLINE COMPOUNDS

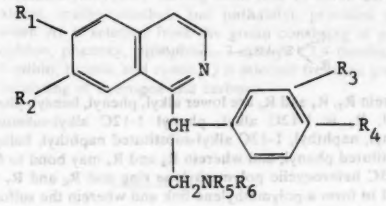
John Lawrence Hughes, Kankakee; Jay Kenneth Seyler, Bourbonnais, and Carroll M. Smith, Park Forest, all of Ill., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Filed Dec. 20, 1974, Ser. No. 534,741

Int. Cl.² C07D *217/12, 295/12*

U.S. Cl. 260—247.5 GP **8 Claims**

1. A compound having the structure:



in which R_1 and R_2 are alkoxy groups of one to four carbon atoms, R_3 and R_4 each is hydrogen or an alkoxy group of one to four carbon atoms, and R_5 and R_6 each is an alkyl group of one to four carbon atoms or benzyl or R_5 taken with R_6 and N are pyrrolidinyl, piperidino, or morpholino groups and the pharmaceutically acceptable salts thereof.

3,966,725

1-(4-PHENOXY-PHENYL)-1,3,5-TRIAZINES

Josef Helmut Reisdorff; Gerd Aichinger; Axel Haberkorn, all of Wuppertal-Elberfeld; Heinrich Kolling, Haan, and Eckart Kranz, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

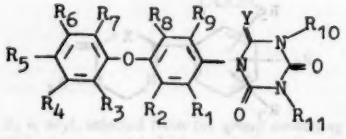
Filed Mar. 18, 1975, Ser. No. 559,562

Claims priority, application Germany, Mar. 21, 1974, 2413722

Int. Cl.² C07D *251/34*

U.S. Cl. 260—248 NS **29 Claims**

1. A compound of the formula



or a pharmaceutically-acceptable, nontoxic salt thereof wherein

R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8 and R_9 are the same or different and each is hydrogen, lower alkyl, halo(lower alkyl), lower alkoxy, halo(lower alkoxy), lower alkylthio, halo(lower alkylthio), halo, nitro, cyano, amino, lower alkanoylamino, lower alkoxycarbonylamino, carboxy,

lower alkoxycarbonyl, carbamoyl, lower alkanoyl, halo(lower alkanoyl), lower alkylsulphinyl, lower alkylsulphonyl, halo(lower alkylsulphinyl), halo(lower alkylsulphonyl) or sulphamoyl; provided that at least one of R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8 and R_9 is halo(lower alkyl), halo(lower alkylthio), halo(lower alkylsulphinyl) or halo(lower alkylsulphonyl);

R_{10} is hydrogen, lower alkyl, cycloalkyl of 4 to 7 carbon atoms, halo(lower alkyl), lower alkoxy, lower alkoxy(lower alkyl), halo(lower alkoxy)(lower alkyl), (lower alkylthio)(lower alkyl), halo(lower alkylthio)(lower alkyl), lower alkenyl, lower alkinyl, lower alkoxycarbonyl, (lower alkylthio)carbonyl, (lower alkylthio)thiocarbonyl, lower alkanoylamino, di(lower alkanoyl)amino, phthalimido, succinimido, di(lower alkyl)amino, benzyl, phenyl or halophenyl;

R_{11} is hydrogen or lower alkyl; and

Y is oxygen or sulphur.

3,966,726

PROCESS FOR THE PRODUCTION OF CYCLIC CARBOXYLIC ACID IMIDES

Anton Toth, and Gerhard Meyer, both of Obernburg, Germany, assignors to Akzo N.V., Arnhem, Netherlands

Filed Sept. 8, 1972, Ser. No. 287,520

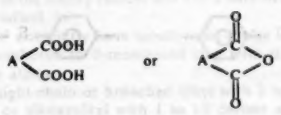
Claims priority, application Germany, Sept. 23, 1971, 2147535

Int. Cl.² C07D 251/52

U.S. Cl. 260—249.8 **10 Claims**

1. In a process for the production of an N-substituted cyclic carboxylic acid imide by reacting in a solvent at an elevated temperature between about 40°C. and 160°C.

A. an ortho-dicarboxylic acid or its anhydride of the formula



wherein A is a divalent radical, selected from amongst phenylene, or phenylene substituted by halogen, nitro, acetamido, lower alkyl, lower alkoxy; tetrahydrophenylene or pyridylene: with

B. a mono- or di-amine, selected from amongst alkylamine, alkylenediamine, N-alkyl substituted alkylenediamine of up to 18 carbon atoms; phenyl mono- or diamines which may be substituted by halo, nitro, hydroxy, mercapto, lower alkyl, lower alkoxy, mercaptomethyl, mercaptoethyl, methyl or ethyl carboxylate, sodium or potassium sulfonate, or 4,4′-diaminodiphenylmethane, 4,4′-diaminodiphenyloxide, 4,4′-diamino diphenylsulfone, 1,5-diaminoanthraquinone, aminopyrazine, 2-aminopyridine, 2-aminothiazole, 2-amino-4-methylpyridine, 6-amino-3-methylpyridine, 2-amino-4-methylpyrimidine, ammeline, 2,6-diaminopyridine, 3-aminopyridine or 4-aminopyridine the improvement of carrying out said reaction in a liquid solvent mixture consisting essentially of a non-polar organic solvent and a strongly polar organic solvent which form a ternary azeotrope with water at the reaction temperature.

3,966,727

MANUFACTURE OF PHTHALO-BIS-GUANAMINES

Hans Diem; Christian Dudeck, and Gunter Lehmann, all of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

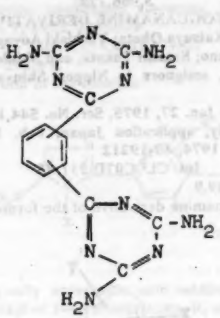
Filed Dec. 16, 1974, Ser. No. 533,145

Claims priority, application Germany, Dec. 29, 1973, 2365180

Int. Cl.³ C07D 251/48

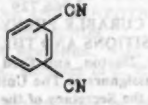
U.S. Cl. 260—249.9 **10 Claims**

1. A process for the manufacture of a phthalo-bis-guanamine of the formula



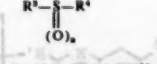
I

wherein the two substituents on the phenylene ring are in the o-, m- or p-position to one another, by reaction of phthalodinitriles of the formula



II

wherein the two substituents are in the o-, m- or p-position to one another, with dicyandiamide in the presence of an inorganic, basic compound and an organic solvent, wherein the solvent is a sulfoxide or a sulfone of the formula



IV,

in which R^3 and R^4 can be identical or different radicals and each is alkyl of 1 to 8 carbon atoms or alkenyl of 2 to 8 carbon atoms, or R^3 and R^4 together are alkylene of 2 to 5 carbon atoms, or the said radicals substituted by carboxylic acid amide or alkoxy of 1 to 3 carbon atoms, and n is 0 or 1; or said solvent is a formamide of the formula

III

in which R^1 and R^2 can be identical or different and each is hydrogen, alkyl of 1–8 carbon atoms, phenyl, or said alkyl or said phenyl substituted by alkyl or alkoxy respectively having 1–4 carbon atoms or R^1 and R^2 together with the adjacent nitrogen form a 5- or 6-membered heterocyclic ring, optionally containing another nitrogen atom or an oxygen atom and optionally substituted by alkyl or alkoxy respectively having 1–4 carbon atoms.

3,966,728

BENZOGUANAMINE DERIVATIVES

Hiromu Murai; Katsuya Ohata; Yoshiaki Aoyagi; Fusao Ueda; Masahiko Kitano; Satoshi Takata, and Shinichi Tada, all of Kyoto, Japan, assignors to Nippon Shinyaku Co., Ltd., Kyoto, Japan

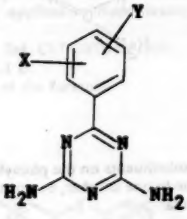
Filed Jan. 27, 1975, Ser. No. 544,176

Claims priority, application Japan, Feb. 18, 1974, 49-19211; Feb. 18, 1974, 49-19212

Int. Cl.² C07D *251/48*

U.S. Cl. 260—249.9 **10 Claims**

1. a benzoguanamine derivative of the formula:



in which X and Y are the same or different halogens in the 2- and 5-positions.

3,966,729

ADDITION CURABLE PHENYL-QUINOXALINE COMPOSITIONS AND THEIR SYNTHESIS

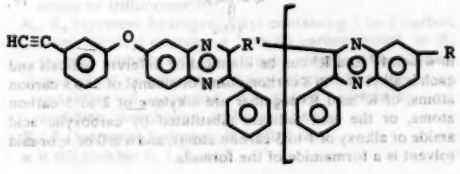
Robert F. Kovar, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

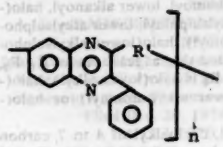
Filed May 19, 1975, Ser. No. 578,846

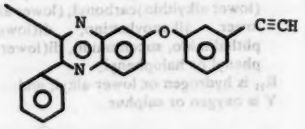
Int. Cl.² C07D *241/42, 241/44*

U.S. Cl. 260—250 Q **6 Claims**

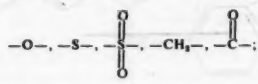
1. An ethynyl terminated polyquinoxaline having the following structural formula:

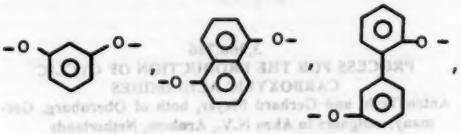




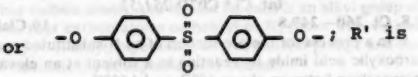


where R is a single bond,

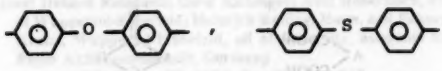


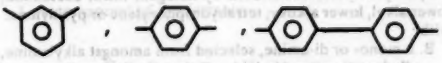


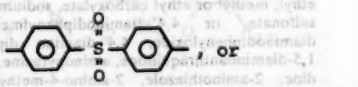
or

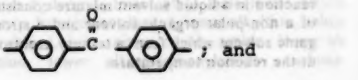


; R' is









; and

and *n* is an integer from 1 to 20, inclusive.

3,966,730
PYRIMIDIN(4)-YL-(THIONO)-(THIOL)-PHOSPHORIC-(PHOSPHONIC)-ACID ESTERS

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel; Lother Rohe, all of Wuppertal; Wolfgang Behrenz, Overath-Steinenbruck; Ingeborg Hammann, Cologne; Wilhelm Stendel, Wuppertal, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

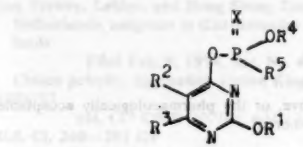
Filed Aug. 22, 1974, Ser. No. 499,808

Claims priority, application Germany, Aug. 31, 1973, 2343931

Int. Cl.² C07F 9/65

U.S. Cl. 260—251 P **3 Claims**

1. A pyrimidin(4)-yl-(thiono)-(thiol)-phosphoric-(phosphonic) acid ester or ester-amide of the formula



in which

R^1 is straight-chain or branched alkyl with 1 to 20 carbon atoms, cycloalkyl with 5 to 7 carbon atoms, alkenyl or alkynyl with 2 to 6 carbon atoms or aralkyl with 6 to 10 carbon atoms in the aryl moiety and 1 to 2 carbon atoms in the alkyl moiety,

R^2 is hydrogen, straight-chain or branched alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, alkylmercapto with 1 to 4 carbon atoms, alkylcarbonyl or alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl or alkoxy moiety, halogen or nitrile,

R^3 is hydrogen, straight-chain or branched alkyl with 1 to 6 carbon atoms, or alkoxycarbonylalkyl with 1 to 4 carbon atoms in the alkoxy radical and 1 to 2 carbon atoms in the alkyl radical, or

R^2 and R^3 conjointly form an alkylene bridge which forms a 5-membered to 7-membered ring with the adjoining carbon atoms,

R^4 is straight-chain or branched alkyl with 1 to 12 carbon atoms or alkoxyalkyl with 1 to 12 carbon atoms in the alkyl radical and 1 to 4 carbon atoms in the alkoxy radical,

R^5 is straight-chain or branched alkyl, alkoxy or alkylmercapto with 1 to 6 carbon atoms or aryl with 6 to 10 carbon atoms, and

X is oxygen or sulfur

3,966,731
2-FLUOROMETHYL-3-o-TOLYL-6-AMINO-4(3H)-QUINAZOLINONE

Ichizo Inoue, Ikeda; Toyonari Oine, Nara; Yoshihisa Yamada, Kyoto; Junichi Tani; Ryuichi Ishida, both of Osaka, and Takashi Ochiai, Kobe, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Sept. 30, 1974, Ser. No. 510,577

Claims priority, application Japan, Oct. 15, 1973, 48-115512

Int. Cl.² C07D 239/91

U.S. Cl. 260—256.4 Q **2 Claims**

1. 2-fluoromethyl-3-(o-tolyl)-6-amino-4(3H)-quinazolinone or a pharmaceutically acceptable acid addition salt thereof.

3,966,732
NITROIMIDAZOLYL PYRIMIDINES

Clemens Rufer; Eberhard Schroder, and Hans-Joachim Kessler, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

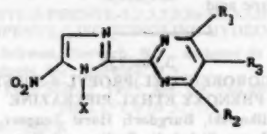
Division of Ser. No. 331,114, Feb. 9, 1973, Pat. No. 3,920,655. This application Apr. 14, 1975, Ser. No. 568,117

Claims priority, application Germany, Feb. 19, 1972, 2208518; Nov. 7, 1972, 2255079

Int. Cl.² C07O 239/00

U.S. Cl. 260—256.4 C **10 Claims**

1. A compound of the formula



and physiologically acceptable acid addition salts thereof wherein X is alkyl of 1–4 carbon atoms, R_1 and R_2 each are a hydrogen atom, alkyl of 1–4 carbon atoms, phenyl, trifluoromethyl, or 2-thienyl, and R_3 is a hydrogen atom, alkyl of 1–4 carbon atoms, hydroxyalkoxy of 2–4 carbon atoms or an ester thereof of an alkanecarboxylic acid of 1–4 carbon atoms or oxoalkyl of 3–6 carbon atoms.

3,966,733
INTERMEDIATES FOR CERTAIN BENZOTHIADIAZEPINE AND BENZOTHIADIAZOCINE COMPOUNDS

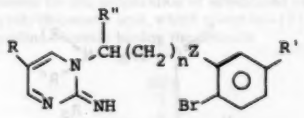
Harry Louis Yale, New Brunswick, N.J., and Ramesh B. Petigara, Lansdale, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 382,802, July 26, 1973, Pat. No. 3,875,162. This application Jan. 15, 1975, Ser. No. 541,165

Int. Cl.² C07D 239/04

U.S. Cl. 260—256.5 R **12 Claims**

1. A compound of the formula



wherein

R is hydrogen,

R′ is hydrogen, F, Cl, Br, CF_3, alkyl of from 1 to 4 carbons, or dialkylamidosulfonyl wherein each alkyl radical has from 1 to 4 carbons;

n is 0 or 1;

R″ is hydrogen or alkyl of from 1 to 4 carbons; and Z is S or SO_2.

3,966,734

METHOD FOR THE PURIFICATION OF 6-METHOXY-1-PHENAZINOL 5,10-DIOXIDE

Joseph Donald Surmatis, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 213,748, Dec. 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 139,287, April 23, 1971, abandoned. This application Feb. 12, 1975, Ser. No. 549,413

Int. Cl.² C07D *241/52*

U.S. Cl. 260—267 3 Claims

1. A process for preparing pure 6-methoxy-1-phenazinol 5,10-dioxide which comprises

a. reacting a ferric chloride hexahydrate in a suspension of a crude mixture containing 6-methoxy-1-phenazinol 5,10-dioxide in a concentrated aqueous mineral acid;

b. isolating the solid ferric chloride complex of 6-methoxy-1-phenazinol 5,10-dioxide which forms;

C admixing this complex with acetone, thereby breaking the complex; c.

d. recovering the pure 6-methoxy-1-phenazinol 5,10-dioxide, wherein the concentrated aqueous mineral acid is selected from the group consisting of hydrochloric acid and sulfuric acid.

3,966,735

1-3-(4-FLUOROBENZOYL)PROPYL-4-SUBSTITUTED PHENOXY ETHYL PIPERAZINE

Wolfgang Milkowski, Burgdorf; Horst Zeugner, Hannover; Klaus-Wolf von Eickstedt, Berlin, and Werner Stühmer, Eldagsen, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

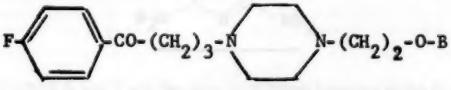
Filed Mar. 5, 1974, Ser. No. 448,381

Claims priority, application Germany, Mar. 12, 1973, 2312171

Int. Cl.² C07D *295/08*

U.S. Cl. 260—268 R 4 Claims

1. A compound having the formula



in which B is a 2-chloro-4-alkanoylphenyl radical, the alkanoyl moiety of which has at least 2 and at most 4 carbon atoms, and pharmaceutically acceptable acid addition salts thereof.

3,966,736

2,9-DIHYDRO-3H-PYRIDO[3,2-c]-s-TRIAZOLO[4,3-a][1,5]-BENZODIAZEPIN-3-ONES

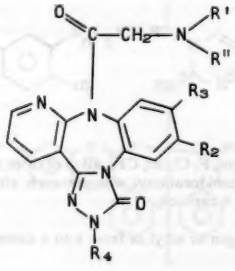
Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 7, 1975, Ser. No. 565,709

Int. Cl.² C07D *471/14*

U.S. Cl. 260—268 PC 10 Claims

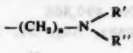
1. A compound of the formula IV



IV

wherein R′ and R″ are alkyl of 1 to 3 carbon atoms or

is pyrrolidino, piperidino, 4-methylpiperazino, or [4-(2-hydroxyethyl)piperazino] wherein R_2 and R_3 are hydrogen, chloro, bromo, trifluoromethyl or alkyl defined as above; and wherein R_4 is hydrogen, alkyl as defined above or



in which *n* is an integral number of 2 or 3 and R′, R″ and

are defined as above, or the pharmacologically acceptable acid addition salts thereof.

3,966,737

FLUORO-SUBSTITUTED DIBENSO[b,f]THIEPINS

Max Gerecke, Reinach; Jean-Pierre Kaplan, Le Plessis Robinson, and Emilio Kyburz, Reinach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

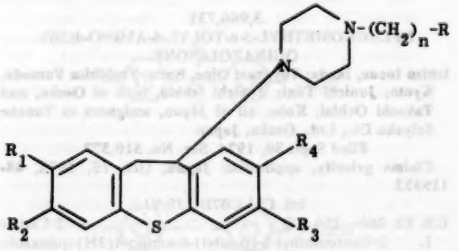
Continuation-in-part of Ser. No. 378,733, July 12, 1973, abandoned. This application May 17, 1974, Ser. No. 471,101

Claims priority, application Switzerland, Mar. 30, 1973, 4606/73; Jan. 16, 1974, 568/74

Int. Cl.² C07D *409/04*

U.S. Cl. 260—268 TR 9 Claims

1. A Compound of the formula



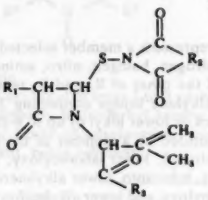
wherein *n* is an integer from 1 to 3; R is hydrogen or, when *n* is 2 or 3, is hydroxy or an alkanoyloxy group of 2–18 carbon atoms; one of R_1 and R_2 is hydrogen and the other is methyl, methoxy, methylthio, dimethylsulfamoyl, fluoro, chloro or trifluoromethyl; and one of R_3 and R_4 is hydrogen, and the other is methyl, methoxy, methylthio, dimethylsulfamoyl, fluoro, chloro or trifluoromethyl, provided that at least one of R_1, R_2, R_3 and R_4 is fluoro,
or a pharmaceutically acceptable acid addition salt thereof.

3,966,738
AZETIDINE DERIVATIVES

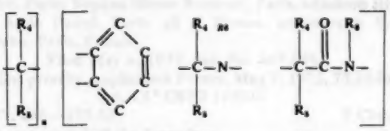
Jan Verwey, Leiden, and Hong Sheng Tan, Bleiswijk, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Feb. 8, 1974, Ser. No. 440,725
Claims priority, application United Kingdom, Feb. 9, 1973, 6576/73
Int. Cl.² C07D *207/24, 401/12, 403/12*
U.S. Cl. 260—281 GP **22 Claims**

1. Acetidine derivatives of the formula



wherein R_1 represents a conventional penicillin- or cephalosporin acylamido group, R_2 is



IIA IIB IIC IID

wherein R_4 and R_5 are individually selected from the group consisting of a hydrogen atom, lower alkyl and alkenyl and n represents 2 or 3 R_6 represents an amino group of the formula

wherein R_7 represents a hydrogen atom or a lower alkyl and R_8 represents a lower alkyl, or R_6 represents a N,N'-disubstituted hydrazine group wherein the substituents are lower alkyl, or R_2 represents the group $-OR_9$, wherein R_9 represents a hydrogen atom, a lower alkyl optionally substituted by 1 to 3 halogen atoms or by 1 or 2 phenyl groups, wherein te phenyl groups may be substituted by a methoxy or a nitro, or R_9 represents a phenacyl or an alkali metal or alkaline earth metal ions and corresponding azetidine derivatives of formula I wherein the double bond in the propenyl side chain has been shifted from the 2- to the 1-position.

3,966,739
PYRROLE-CARBOXYLIC ACIDS LUMILYSERGOL ESTERS

Luigi Bernardi, Milan; Germano Bosisio, Palazzolo Milanese, and Gian Carlo Fregnan, Milan, all of Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

Filed Mar. 7, 1972, Ser. No. 232,605
Claims priority, application Italy, Mar. 13, 1971, 21713/71; Nov. 13, 1971, 31059/71
Int. Cl.² C07D *457/02*
U.S. Cl. 260—285.5 **4 Claims**

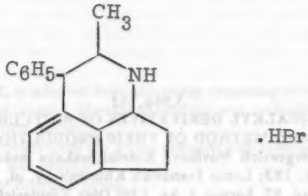
1. 1,6-Dimethyl-8β-[2'-methyl-3'-pyrroyloxymethyl]-10α-methoxyergoline or the maleate thereof.
2. 1,6-Dimethyl-8β-[3', 5'-dimethyl-2'-pyrroyloxymethyl]-10α-methoxyergoline or the maleate thereof.
3. 1,6-Dimethyl-8β-[1', 3', 5'-trimethyl-2'-pyrroyloxymethyl]-10α-methoxyergoline or the maleate thereof.
4. 1,6-Dimethyl-8β-[1'-ethyl-2'-pyrroyloxymethyl]-10α-methoxyergoline or the maleate thereof.

3,966,740
2-METHYL-3-PHENYL-1,2,3,7,8,8a-HEXAHYDRO-1H-CYCLOPENT[i,j]-ISOQUINOLINE HYDROBROMIDE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Mar. 7, 1975, Ser. No. 556,467
Int. Cl.² C07D *217/14*
U.S. Cl. 260—286 R **1 Claim**

1. A compound of the formula:

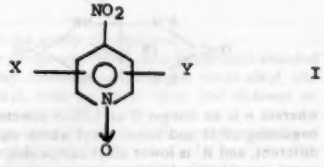


3,966,741
PROCESS FOR THE PREPARATION OF SUBSTITUTED OR UNSUBSTITUTED 4-PYRIDYLTHIOACETIC ACID

Andreas J. J. Hendrickx, Venlo, and Willem H. van Duyl, Grubbenvorst, both of Netherlands, assignors to Oce-Andeno B.V., Venlo, Netherlands

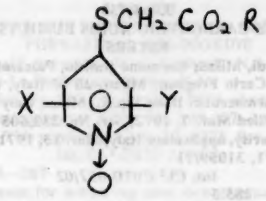
Filed Dec. 4, 1974, Ser. No. 529,457
Claims priority, application Netherlands, Dec. 13, 1973, 7317069
Int. Cl.² C07D *213/70*
U.S. Cl. 260—294.8 G **14 Claims**

1. A process for the preparation of substituted or unsubstituted 4-pyridylthioacetic acid, which comprises (1) reacting a 4-nitro-pyridine-N-oxide having the formula



I

with a compound having the formula $HSCH_2CO_2R$ to form a compound having the formula



in which formula X is a hydrogen or a halogen atom or an alkyl or alkoxy group, said groups containing 1–4 carbon atoms, Y is a hydrogen atom, an alkyl or alkoxy group, said groups containing 1–4 carbon atoms and R is an alkyl group containing 1–4 carbon atoms; (2) reducing the formed compound by reacting it with finely divided iron in the presence of a catalytic quantity of hydrochloric acid or acetic acid to obtain a corresponding 4-pyridylthioacetic acid ester, and (3) converting said ester into the corresponding 4-pyridylthioacetic acid by saponification followed by acidification.

3,966,742

TETRA-N-ALKYL DERIVATIVES OF BICYCLIC UREAS AND METHOD OF THEIR PRODUCTION

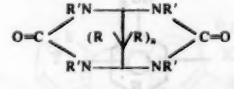
Sergei Sergeevich Novikov, Kotelnicheskaya naberezhnaya, 1/5, kv. 183; Lenor Ivanovich Khmelnitsky, ul. Miklukho-Maklaya, 57, korpus 1, kv. 139; Oleg Vasilievich Lebedev, ul. Obrucheva, 9, kv. 83; Lia Vladimirovna Epishina, Bolotnikovskaya 40, korpus 1, kv. 16; Ljudmila Ivanovna Suvorova, B. Ostroumovskaya, 15, kv. 24, all of Moscow; Lidia Vasilievna Lapshina, Podolsky raion, p/o Ryazanovo, dom otdykha ostafievo, 17, Moskovskaya oblast; Valery Dmitrievich Krylov, ul. Uralskaya, 17, kv. 150, Moscow; Irina Vitalievna Zaikonnikova, ul. Chekhova, 4b, kv. 1, Kazan; Irina Evgenievna Zimakova, ul. Lenina, 2a, kv. 18, Kazan; Vladimir Sergeevich Chudnovsky, ul. Dekabristov, 189, kv. 5, Kazan; Viktor Andreevich Babichev, Komsmolsky prospekt, 38/16, kv. 81, Moscow, and Nina Alexandrovna Avdonina, ul. Gagarina, 14, kv. 3, Kazan, all of U.S.S.R.

Filed July 27, 1972, Ser. No. 275,823

Int. Cl.² C07D *239/04*

U.S. Cl. 260—256.4 F **8 Claims**

1. A method for producing tetra-N-alkyl derivatives of bicyclic ureas having the formula:



wherein *n* is an integer 0 or 1, R is selected from the group consisting of H and lower alkyl which can be the same or different, and R′ is lower alkyl comprising alkylating bicyclic ureas, unsubstituted at the nitrogen atoms, with lower alkyl halides in liquid ammonia under the action of an alkali metal amide, followed by separation of the product.

3,966,743

ORTHO FUSED CYCLOALKANO-4-QUINOLONE-3-CARBOXYLIC ACID DERIVATIVES

Herbert Berger, Mannheim-Kafertal; Alfred Rhomberg, Mannheim-Neuostheim; Kurt Stach, Mannheim-Waldhof; Wolfgang Vömel, Mannheim, and Winfriede Sauer, Mannheim-Wallstadt, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

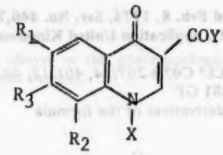
Continuation-in-part of Ser. Nos. 363,211, May 23, 1973, abandoned, Ser. No. 363,235, May 23, 1973, abandoned, and Ser. No. 326,203, Jan. 24, 1973, abandoned, said Ser. No. 363,211, is a continuation of Ser. No. 98,957, Dec. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 843,182, July 18, 1969, abandoned, Ser. No. 363,235, , which is a continuation of Ser. No. 119,035, Feb. 25, 1971, abandoned. This application Sept. 9, 1974, Ser. No. 504,589

Claims priority, application Germany, July 23, 1968, 1770951; Mar. 14, 1969, 1912944; Mar. 13, 1970, 2011885; May 25, 1970, 2025363; Sept. 4, 1970, 2043817; Feb. 19, 1972, 2207856

Int. Cl.³ C07D *215/56*

U.S. Cl. 260—287 CF **36 Claims**

1. A cycloalkano-quinolone compound having the formula:



wherein one of R_1 and R_3 represents a member selected from the group consisting of hydrogen, halogen, nitro, amino and lower alkanoyl amino, and the other of R_1 and R_3 taken together with R_3 forms an alkylene bridge containing 3 to 5 carbon atoms, X is hydrogen or lower alkyl of up to 6 carbon atoms, which may be substituted by a member of the group consisting of halogen, hydroxyl, lower alkanoyloxy, lower alkoxy, phenoxy, benzyloxy, mercapto, lower alkylmercapto, lower carbocyclic arylsulfonyloxy, and lower alkylsulfonyloxy, or X is unsubstituted lower alkenyl including alkadienyl, or lower alkynyl, and Y is a member selected from the group consisting of hydroxyl and lower alkoxy; and the non-toxic salts thereof.

3,966,744

SPIN LABELED COMPOUNDS

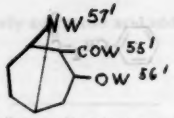
Avram Goldstein, Stanford; Richard K. Leute, Sunnyvale, and Edwin F. Ullman, Atherton, all of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. Nos. 105,535, Jan. 11, 1971, abandoned, and Ser. No. 141,516, May 10, 1971, Pat. No. 3,690,834, and a continuation of Ser. No. 270,108, July 10, 1972, Pat. No. 3,853,914. This application June 24, 1974, Ser. No. 482,542

Int. Cl.² C07D *451/12*, *451/06*

U.S. Cl. 260—292 **4 Claims**

1. A compound according to the formula:



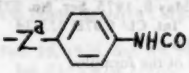
wherein one of W^{56} and W^{57} is -X*-A*; when other than —X*—A*:

W^{56} is hydrogen or benzoyl; and

W^{57} is methyl;

W^{55} is hydroxy or methoxy;

X* is



wherein

Z^a is methylene, carbonyl or —Z—CONH— wherein Z is aliphatic hydrocarbylene of from 1 to 7 carbon atoms, having 0 to 1 site of unsaturation, said unsaturation, where present, being ethylenic; and

A* is of the formula:

wherein

R^{3-5} are alkyl of from 1 to 3 carbon atoms and Y' is trivalent aliphatic hydrocarbyl having 1 to 3 carbon atoms and 0 to 1 site of unsaturation, said unsaturation, where present, being ethylenic.

3,966,745

VINVAMINE SERIES CYCLOALKYL-ALKYL ESTERS

Don Pierre René Lucien Giudicelli, Fontenay-sous-Bois; Henry Najer, Paris; Bogdan Iliesco-Branceni, Paris, and Yves Robert Alain Pascal, Paris, all of France, assignors to Synthelabo, Paris, France

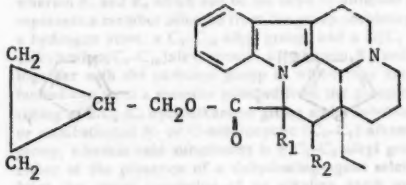
Filed May 6, 1974, Ser. No. 467,596

Claims priority, application France, May 7, 1973, 73.16266

Int. Cl.² C07D *519/04*

U.S. Cl. 260—293.53 **7 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen or hydroxy:

R_2 is hydrogen, or

R_1 and R_2 together represent an additional bond between the two carbon atoms to which they are attached, or a pharmaceutically acceptable acid addition salt thereof.

3,966,746

AMINO DERIVATIVES OF PYRAZOLOPYRIDINE CARBOXAMIDES

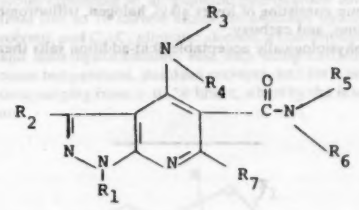
Hans Hoehn, Tegernheim, and Theodor Denzel, Nurnberg, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 489,636, July 18, 1974, abandoned, which is a division of Ser. No. 306,967, Nov. 15, 1972, Pat. No. 3,840,456. This application June 4, 1975, Ser. No. 583,373

Int. Cl.² C07D *471/04*

U.S. Cl. 260—293.6 **8 Claims**

1. A compound of the formula



wherein R_1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, phenyl-lower alkyl, and cycloalkyl having 3 to 7 carbon atoms;

R_2 is selected from the group consisting of hydrogen, lower alkyl, and phenyl;

the basic nitrogen group

is selected from the group consisting of

i. acyclic amino groups wherein R_3 and R_4 are each selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower alkanoyl, phenyl, substituted phenyl, phenyl-lower alkyl, di-lower alkyl amino-lower alkyl, benzoyl, substituted benzoyl, phenyl-lower alkanoyl, subatituted phenyl-lower alkanoyl, alkane sulfonyl, benzenesulfonyl, and substituted benzenesulfonyl and

ii. heterocyclic groups selected from the group consisting of pyrrolidino, piperidino and piperazino;

the basic nitrogen group

is selected from the group consisting of

i. acyclic amino groups wherein R_3 and R_4 are each selected from the group consisting of hydrogen, lower alkyl, alkoxy lower alkyl, dialkoxy lower alkyl, and di-lower alkylamino-lower alkyl and

ii. heterocyclic groups selected from the group consisting of pyrrolidino and piperidino;

R_7 is selected from the group consisting of hydrogen, lower alkyl, and phenyl;

with the proviso that at least one of the groups

and

is a heterocyclic group;

wherein lower alkyl and lower alkenyl refer to hydrocarbon groups having 1 to 8 carbon atoms;

wherein lower alkanoyl refers to acyl radicals of acids having the formula $C_nH_{2n+1}COOH$ wherein n must be 7 or less;

wherein substituted phenyl, substituted benzoyl, and substituted benzenesulfonyl refers to the respective moieties substituted with one or two substituents selected from the group consisting of lower alkyl, halogen, trifluoromethyl, amino, and carboxy;

and physiologically acceptable acid-addition salts thereof.

3,966,747

9-HYDROXY-6,7-BENZOMORPHANS

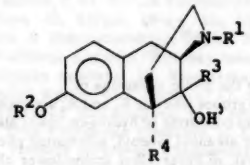
Ivo Monkovic, Candiac; Michel Saucier, Dorval; Yvon Lambert, Cote Ste. Catherine, all of Canada, and Thomas Alfred Montzka, Manlius, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 301,049, Oct. 26, 1972, abandoned. This application July 9, 1974, Ser. No. 486,936

Int. Cl.² C07D 221/26

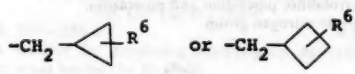
U.S. Cl. 260—293.54 **17 Claims**

1. A compound having the formula



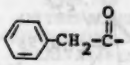
L

wherein R^1 is selected from the group consisting of



in which R^6 is H or CH_3, R^2 is selected from the group consisting of H, (lower)alkyl, (lower)alkanoyl,

$-CH_2O-CH_3$ and



R^3 is H or CH_3, R^4 is n-propyl or (lower)alkenyl; or a pharmaceutically acceptable acid addition salt thereof.

3,966,748

PARA-FLUOROPHENYL-N-HETEROCYCLIC SUBSTITUTED BUTANES

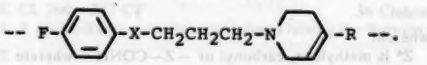
Corris Mabelle Hofmann, Ho-Ho-Kus, and Sidney Robert Safir, River Edge, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 8, 1975, Ser. No. 575,846

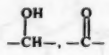
Int. Cl.² C07D 213/34

U.S. Cl. 260—294.8 D **16 Claims**

1. A compound of the formula:

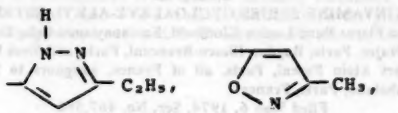


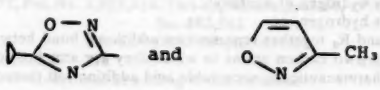
wherein X is selected from the group consisting of



and

wherein R' is lower alkyl; and R is selected from the group consisting of:





and

and pharmaceutically acceptable acid addition salts thereof.

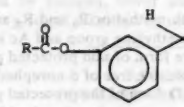
3,966,749

NOVEL SYNTHESIS OF OPTICALLY ACTIVE M-ACYLOXY-α-[(METHYLAMINO)METHYL]BENZYL ALCOHOLS, THE PHARMACEUTICALLY ACCEPTABLE ACID ADDITION SALTS THEREOF AND INTERMEDIATE USEFUL IN THE PREPARATION THEREOF

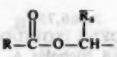
Nicolae S. Bodor, and Sun-Shine Yuan, both of Lawrence, Kans., assignors to Interx Research Corporation, Lawrence, Kans.

Filed Feb. 10, 1975, Ser. No. 548,606
Int. Cl.² C07D 213/02
U.S. Cl. 260—295 R **13 Claims**

1. A method for preparing an optically and therapeutically active (m-acyloxy-α-[(methylamino)methyl]benzyl alcohol of the formula:

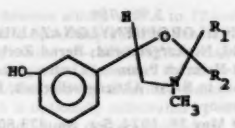


wherein R represents a member selected from the group consisting of a straight or branched alkyl group or from one to twenty carbon atoms, an ethoxycarbonyl group, a benzyloxycarbonyl group, a phenyl group, an



group, wherein R is as defined above and R_3 is a member selected from the group consisting of a hydrogen atom, a methyl group and a phenyl group, and a 2-, 3-, or 4-pyridyl group, or the HX salts thereof, wherein X represents a pharmaceutically acceptable acid addition salt anion which consists essentially of

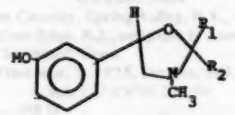
1. reacting optically active phenylephrine with an excess of a carbonyl compound of the formula: $R_1—CO—R_2$, wherein R_1 and R_2 which can be the same or different and represent a member selected from the group consisting of a hydrogen atom, a C_1–C_{10} alkyl group, and a di(C_1–C_3)alkylamino(C_1–C_{10})alkyl group, or wherein R_1 and R_2 together with the carbonyl group to which they are attached can form a member selected from the group consisting of a C_5–C_7 cycloalkanone group and a substituted or unsubstituted N- or O-heterocyclic (C_5–C_7) alkanone group, wherein said substituent is a C_1–C_3 alkyl group, either in the presence of a dehydrating agent selected from the group consisting of an alkaline earth metal carbide, a molecular sieve of from 4 to 5 A, calcium chloride, magnesium sulfate, and sodium sulfate, or in the presence of a conventional inert aromatic hydrocarbon solvent plus an organic or inorganic acid catalyst to eliminate the water formed as an azeotropic mixture, said step being carried out at a temperature of from 20° to 140° C, standard pressure, and for a period of time ranging from 2° to 2 to 48 hours, whereby the intermediate;



(II)

wherein R_1 and R_2 are defined as above is formed;

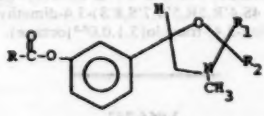
2. reacting the intermediate of step (1) with a member selected from the group consisting of an M-hydroxide, an M-hydride, and an M-alkoxide, wherein M represents a member selected from the group consisting of an alkali earth metal, an alkaline earth metal and thallium in the presence of an inert organic solvent selected from the group consisting of an aliphatic hydrocarbon solvent or from five to 10 carbon atoms, an aromatic hydrocarbon solvent, and C_1–C_4 aliphatic alcohol, a conventional ether and dimethylformamide, said step being carried out at room temperature, standard pressure, and for a period of time ranging from 1 to 24 hours, whereby the intermediate:



(III)

wherein M, R_1, and R_2 are defined above is formed;

3. reacting the intermediate of step (2) with a stoichiometric amount of an acyl halide of the formula: R—CO—Y, wherein R is defined as above and Y represents a halogen atom in the presence of an inert organic solvent selected from the group consisting of an aliphatic hydrocarbon solvent of from five to 10 carbon atoms, an aromatic hydrocarbon solvent, methanol, propanol, butanol, a conventional ether, and dimethylformamide, said step being carried out at room temperature, standard pressure, and for a period of time ranging from 1 to 24 hours, whereby the intermediate:



(IV)

wherein R, R_1, and R_2 are defined as above is formed; and

4. cleaving the $R_1—CO—R_2$ moiety of the intermediate from step (3) in an organic inert solvent selected from the group consisting of an aliphatic hydrocarbon solvent of from five to ten carbon atoms, an aromatic hydrocarbon solvent, a C_1–C_4 aliphatic alcohol, a conventional ether, and dimethyl formamide and further in the presence of a stoichiometric or excess amount of water and a catalytic amount of an HX acid, wherein X is defined as above, said step being carried out at a temperature of from 20° to 100° C, standard pressure, and for a period of time of from 1 to 24 hours, whereby the free base of formula (I) is obtained.

3,966,750
N-3,5-DICHLOROPHENYLOXAZALIDINES

Dietrich Mangold, Neckargemuend; Bernd Zeeh, Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

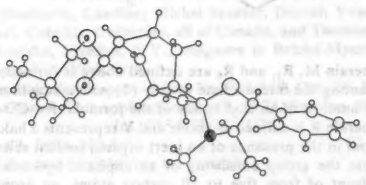
Filed May 28, 1974, Ser. No. 473,505
Int. Cl.² C07D 263/44
U.S. Cl. 260—307 B 1 Claim

1. N-(3,5-dichlorophenyl)-5-methyl-5-vinyloxazolidine-2,4-dione.

3,966,751
OXAZOLIDINES OF 4-OXO-TRICYCLO[5.1.0^{2,5}]OCTAN-8-ENDO-CARBOXALDEHYDE, NEOPENTYL GLYCOL ACETAL

Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 315,364, Dec. 15, 1972, abandoned, which is a division of Ser. No. 181,246, Sept. 16, 1971, Pat. No. 3,711,515, which is a continuation-in-part of Ser. No. 93,483, Nov. 27, 1970, abandoned. This application Jan. 22, 1975, Ser. No. 543,196
Int. Cl.² C07D 263/06
U.S. Cl. 260—307 FA 3 Claims



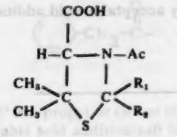
1. An oxazolidine, which is 8′(5,5-dimethyl-1,3-dioxan-2-yl)-(1′R,2′R, 4S,4′R,5R,5′S,7′S,8′S)-3,4-dimethyl-5-phenyl-spiro(oxazolidine-2,4′-tricyclo[5.1.0.0^{2,5}]octane).

3,966,752
RESOLUTION OF D,L-PROTECTED-PENICILLAMINE

Friedrich Asinger, Aachen; Heribert Offermanns, Grossauheim; Karl-Heinz Gluzek, Alpen, and Walter vonBebenburg, Buchschlag, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

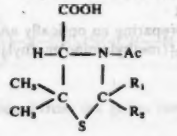
Continuation-in-part of Ser. No. 276,530, July 31, 1972, abandoned, and a continuation-in-part of Ser. No. 419,473, Nov. 27, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,899
Int. Cl.² C07D 277/06
U.S. Cl. 260—306.7 C 27 Claims

1. A process comprising the step of crystallizing out of solution the salt of an optically active base with an optically active form of penicillamine having at least one of the hydrogen atoms of the mercapto group and the amino group protected as a compound of the formula:



where R_1 and R_2 are both methyl or R_1 and R_2 are joined together to form the pentamethylene group and Ac is formyl employing the D,L racemate form of said protected penicillamine and l-norephedrine free of d-norephedrine and precipitating the salt of the D-form of the protected penicillamine and the l-norephedrine.

10. A process comprising the step of crystallizing out of solution the salt of an optically active base with an optically active form of penicillamine having at least one of the hydrogen atoms of the mercapto group and the amino group protected as a compound of the formula:



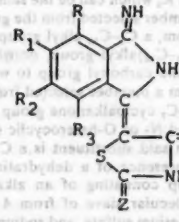
in which R_1 and R_2 are both methyl or R_1 and R_2 are joined together to form the pentamethylene group and Ac is formyl, employing the D,L racemate form of said protected penicillamine and a salt of l-norephedrine free of d-norephedrine and precipitating the salt of the D-form of the protected penicillamine and l-norephedrine.

3,966,753
THIAZOLIDINYLIDENE ISOINDOLINE PIGMENTS

Nathan N. Crounse, and Nicholas A. Ambrosiano, both of Cincinnati, Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Filed Aug. 9, 1974, Ser. No. 496,078
Int. Cl.² C07D 277/34
U.S. Cl. 260—306.7 R 5 Claims

1. A compound of the formula



in which R, R_1, R_2 and R_3 are the same or different and are selected from the class consisting of hydrogen, alkyl having one to three carbon atoms, alkoxy having one to three carbon atoms, halo, trifluoromethyl, phenyl and phenyl substituted by alkyl having one to three carbon atoms, alkoxy having one to three carbon atoms or halogen; and Z is oxygen or sulfur.

3,966,754
CERTAIN SULFONIC ACID ESTERS

Beat Böhner, Binningen; Dag Dawes, Pratteln; Willy Meyer, Basel; Haukur Kristinsson, Bottmingen, and Kürt Rüfenacht, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 12, 1974, Ser. No. 478,680

Claims priority, application Switzerland, June 14, 1973, 8520/73; Apr. 29, 1974, 5829/74

Int. Cl.² C07D *249/04*, *249/12*

U.S. Cl. 260—308 R **11 Claims**

1. A sulphonic acid ester of the formula

$$R_1 - SO_2 - O - R_2$$

wherein

R_1 represents C_1–C_8 alkyl or C_2–C_6 alkenyl optionally substituted by halogen, lower alkoxy or lower alkylthio; and

R_2 represents 1,2,3-triazolyl(4), 1,2,3-triazolyl(5), 1,2,4-triazolyl(5) or 1,2,4-triazolyl(3) optionally substituted by halogen; alkoxy, alkylthio, alkylsulphinyl, alkylsulphonyl, alkylthioalkyl, haloalkyl or alkoxyalkyl, each having lower alkyl groups; alkenyl, alkenyloxy or alkenylthio each having 2–5 carbon atoms; amino, mono-(lower)alkylamino or di-(lower)alkylamino; carbamoyl; carb-(lower)alkoxy; nitro; cyano; or phenyl, phenylthio, phenylsulphinyl, phenylsulphonyl, benzyl, benzylthio, benzylsulphinyl, benzylsulphonyl, 1-phenethyl, 2-phenethyl, diphenylmethyl or C_5–C_6 cycloalkyl, optionally substituted by halogen, lower alkyl, lower haloalkyl, lower alkoxy, lower alkylthio or nitro.

3,966,755
COUMARIN DERIVATIVES

Hans Schlapfer, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

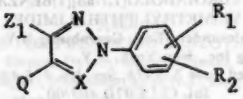
Filed June 18, 1973, Ser. No. 370,880

Claims priority, application Switzerland, June 21, 1972, 9335/72

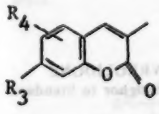
Int. Cl.² C07D *405/04*, *405/14*, *413/14*

U.S. Cl. 260—308 A **12 Claims**

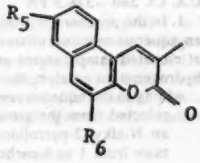
1. Compounds of the formula



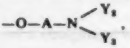
wherein Z_1 represents hydrogen or methyl, R_1 represents hydrogen, halogen, alkyl with 1 to 4 carbon atoms or alkoxy with 1 to 4 carbon atoms, R_2 represents hydrogen, halogen or alkyl with 1 to 4 carbon atoms, X represents nitrogen and Q represents a radical



or



wherein R_2 denotes alkoxy with 1 to 12 carbon atoms, benzyloxy which is optionally chlorine-substituted in the phenyl radical, acetylamino, a —NHCOOY radical, wherein Y represents alkyl with 1 to 12 carbon atoms or phenyl which is optionally substituted by chlorine, methyl or methoxy, or phenyl which is optionally substituted by chlorine, methyl or methoxy, an optionally quaternised radical



wherein A represents alkylene with 2 to 4 carbon atoms, Y_2 and Y_3 independently of one another represent optionally hydroxy-substituted alkyl with 1 to 4 carbon atoms, R_4 denotes hydrogen, chlorine, methyl or methoxy and R_5 and R_6 independently of one another denote hydrogen or alkyl with 1 to 4 carbon atoms.

3,966,756
SUBSTITUTED DIBENZO[b,f]TETRAZOLO[1,5-d][1,4]-OXAZEPINES

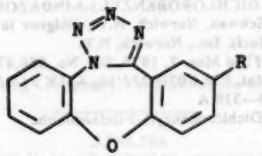
Lantz Stephen Crawley, Spring Valley, N.Y., and Sidney Robert Safir, River Edge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 7, 1975, Ser. No. 565,907

Int. Cl.² C07D *257/04*

U.S. Cl. 260—308 D **4 Claims**

1. A compound of the formula:



wherein R is selected from the group consisting of hydrogen and halogen.

3,966,757
IMIDAZOLINE DERIVATIVES AND PROCESSES FOR THE PRODUCTION THEREOF

Horst Baganz, Moorrege, and Hans-Joachim May, Neustadt-Hambach, both of Germany, assignors to A. Nattermann & Cie GmbH, Germany

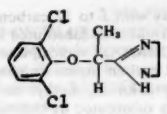
Continuation-in-part of Ser. No. 440,345, Feb. 7, 1974, abandoned, which is a continuation of Ser. No. 164,815, July 21, 1971, abandoned, which is a continuation of Ser. No. 706,665, Feb. 19, 1968, abandoned. This application Apr. 8, 1975, Ser. No. 566,136

Claims priority, application Germany, Feb. 23, 1967, 30055

Int. Cl.² C07D *49/34*

U.S. Cl. 260—309.6 **2 Claims**

1. A compound having the formula



and its pharmaceutically acceptable acid addition salts.

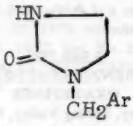
3,966,758

ANTI-INFLAMMATORY 1-(SUBSTITUTED BENZYL)-2-IMIDAZOLIDINONES

Thomas J. Schwan, and Nelson J. Miles, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed June 16, 1975, Ser. No. 586,921
Int. Cl.² C07D 49/34
U.S. Cl. 260—309.7 5 Claims

1. A compound of the formula:



wherein Ar is 4-chlorophenyl, 3-fluorophenyl, 2,3-dichlorophenyl, and 1-naphthyl.

3,966,759

1-(3,4-DICHLOROBENZYL)-3-INDAZOLINONE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Mar. 7, 1975, Ser. No. 556,479
Int. Cl.² C07D 231/56; A61K 31/415
U.S. Cl. 260—310 A 1 Claim

1. 1-(3,4-Dichlorobenzyl)-3-indazolinone

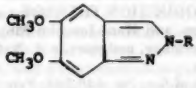
3,966,760

2-SUBSTITUTED-5,6-DIMETHOXYINDAZOLES

Thomas J. Schwan; Charles S. Davis, both of Norwich, and Leroy J. Honkomp, Oxford, all of N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed May 23, 1974, Ser. No. 472,719
Int. Cl.² C07D 231/56
U.S. Cl. 260—310 C 15 Claims

1. A compound of the formula:



wherein R is cyclohexyl, 2-phenethyl, p-diethylaminophenyl, dimethylamino, 2-diethylaminoethyl, 2-tetrahydropyranylmethyl, 2-(5,6-dimethoxy-2-indazolyl) ethyl, 2-methoxyethyl, allyl, 2,3-dihydroxypropyl, phenyl, 3-dimethylaminopropyl, 2-hydroxyethyl or hydroxy; and X is zero, one, or two.

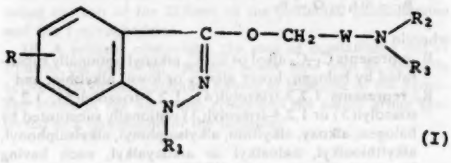
3,966,761

NOVEL AMINO-INDAZOLE COMPOUNDS

Ctirad Podesva, Montreal, and William T. Scott, Chateauguay, both of Canada, assignors to Delmar Chemicals Limited, Ville La Salle, Canada

Filed Feb. 7, 1974, Ser. No. 440,445
Claims priority, application United Kingdom, Feb. 7, 1973, 6030/73
Int. Cl.² C07D 231/56; A61K 31/415; A01N 9/22
U.S. Cl. 260—310 C 8 Claims

1. A tertiary amino-indazole compound of formula I:



(I)

wherein

R is a hydrogen atom or a halogen atom;

R_1 is an alkyl group having 1 to 6 carbon atoms, or a phenyl alkyl group, the alkyl group having 1 to 6 carbon atoms;

R_2 and R_3 which may be the same or different and each is an alkyl group having 1 to 6 carbon atoms;

W is a branched chain alkylene group comprising a divalent straight chain lower alkyl group having 1 to 6 carbon atoms pendant from the beta or gamma carbon atom relative to the carbon atom;

or a non-toxic acid addition salt thereof.

3,966,762

N-[(6,7-DIHYDROINDOLO[1,7-ab][1]BENZAZEPIN-2-YL)METHYL]PHTHALIMIDE

John Ernest Alexander, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed June 3, 1974, Ser. No. 475,445
Int. Cl.² C07D 403/00
U.S. Cl. 260—326 D 1 Claim

1. N-[(6,7-Dihydroindolo[1,7-ab][1]benzazepin-2-yl)methyl]phthalimide.

3,966,763

PROCESS FOR PRODUCING 2-PYRROLIDONE

Janice L. Greene, Chagrin Falls, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed June 30, 1975, Ser. No. 591,878
Int. Cl.² C07D 207/26
U.S. Cl. 260—326.5 FN 9 Claims

1. In the process for producing 2-pyrrolidone by contacting an aqueous reaction mixture of succinonitrile with hydrogen at elevated temperatures and pressures in the presence of a hydrogenation catalyst, the improvement comprising:

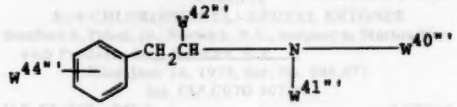
adding to the aqueous reaction mixture a reaction promoter selected from the group consisting of 2-pyrrolidone and an N-alkyl-2-pyrrolidone wherein the alkyl group contains from 1 to 6 carbon atoms.

3,966,764
LIGAND DETERMINATION OF SPIN LABELED COMPOUNDS BY RECEPTOR DISPLACEMENT-AMPHETAMINE ANALOGS

Avram Goldstein, Stanford; Richard K. Leute, Sunnyvale, and Edwin F. Ullman, Atherton, all of Calif., assignors to Syva Company, Palo Alto, Calif.

Division of Ser. No. 270,108, July 10, 1972, Pat. No. 3,853,914. This application June 24, 1974, Ser. No. 482,200
Int. Cl.² C07D *207/14*
U.S. Cl. 260—326.85 **6 Claims**

1. A spin labeled reagent which is of the formula:

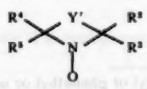


wherein one of W^{40}, W^{42}, and W^{44} is -X*-A*; when other than -X*-A*;

W^{40} is hydrogen;
W^{42} is methyl; and
W^{44} is hydrogen;
W^{41} is hydrogen or methyl;

X* is -Z-CONH-, wherein Z is hydrocarbylene of from 1 to 7 carbon atoms, having from 0 to 1 site of ethylenic unsaturation, with the proviso that when W^{44} is -X*-A*, X* is -O-Z-CONH-; and

A* of the formula:



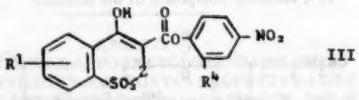
wherein R^{2-5} is alkyl of from 1 to 3 carbon atoms and Y' is a trivalent radical of from 1 to 3 carbon atoms and 0 to 1 heteroatoms, wherein said heteroatom is oxygen, sulfur or nitrogen.

3,966,765
PROCESS FOR PRODUCING BENZOTHIOPYRANS

Jagadish C. Sircar, Dover; Harold Zinnes, Rockaway, and John Shavel, Jr., Mendham, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 464,707, April 26, 1975, Pat. No. 3,878,198. This application Oct. 11, 1974, Ser. No. 513,986
The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.
Int. Cl.² C07D *335/06*
U.S. Cl. 260—327 TH **1 Claim**

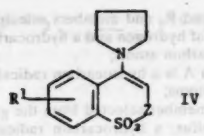
1. A process for the production of a compound of the formula:



III

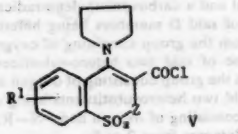
wherein Z is CHR^2; R^1 is hydrogen, a lower alkyl of 1 to 7 carbon atoms, a lower alkoxy of 1 to 7 carbon atoms, halogen, cyano, or trifluoromethyl; R^2 is hydrogen, lower alkyl of 1 to 7 carbons, or aralkyl wherein the alkyl moiety contains from 1 to 7 carbons and the aryl is a monocyclic aromatic radical of 6 to 10 carbon atoms; and R^4 is hydrogen or a nitro radical which comprises:

A. treating a compound of the formula:



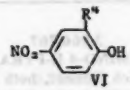
IV

with phosgene to give a compound of the formula



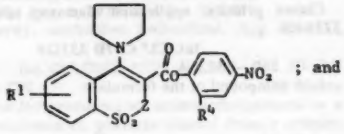
V

B. reacting compound V with a compound of the formula:



VI

to obtain a compound of the formula:



; and

VII

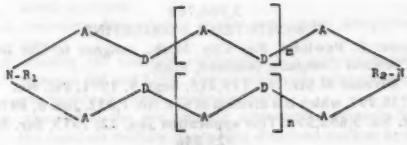
C. hydrolyzing Compound VII under acidic conditions.

3,966,766
MONOCYCLIC MACROCYCLIC COMPOUNDS AND COMPLEXES THEREOF

Jean-Marie Lehn, Strasbourg, France, assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 344,682, March 26, 1973, Pat. No. 3,888,877, which is a continuation-in-part of Ser. No. 43,979, June 5, 1970, abandoned. This application Mar. 20, 1975, Ser. No. 560,281
Int. Cl.² C07D *273/00*
U.S. Cl. 260—327 R **13 Claims**

1. A macrocyclic compound selected from the group consisting of a compound of the following formula I:



I

wherein R_1 and R_2 and members selected from the group consisting of hydrogen and a hydrocarbon radical having up to 12 carbon atoms;
wherein each A is a hydrocarbon radical having from 2 to 8 carbon atoms;
each D is a member selected from the group consisting of oxygen, sulfur, a hydrocarbon radical having up to 8 carbon atoms, and =N—R (R being a member selected from the group consisting of hydrogen, a hydrocarbon radical having up to 12 carbon atoms, an aryl hydrocarbonsulfonyl radical having up to 12 carbon atoms, a lower alkoxycarbonyl radical, a lower alkoxycarbonylmethylene radical and a carboxymethylene radical);
at least two of said D members being hetero-substituents selected from the group consisting of oxygen, sulfur and =N—R; one of said two hetero-substituents being selected from the group consisting of oxygen and sulfur, the other of said two heterosubstituents being selected from the group consisting of oxygen and =N—R;
m and *n* are integers from 0 to 5;
and the ammonium quaternary salts and acid addition salts thereof.

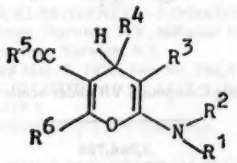
3,966,767

2-AMINO-4 H-PYRANE

Horst Meyer; Friedrich Bossert, both of Wuppertal; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 375,809, July 2, 1973, Pat. No. 3,897,462. This application Nov. 25, 1974, Ser. No. 526,800
Claims priority, application Germany, July 19, 1972, 2235406
Int. Cl.² C07D *333/24*
U.S. Cl. 260—332.2 A **5 Claims**

1. A compound of the formula



wherein

R^1 and R^2 are the same or different and each is hydrogen or lower alkyl;
R^3 is lower alkyl;
R^4 is thienyl unsubstituted or substituted by lower alkyl, halogen or lower alkoxy;
R^5 is —OR'' wherein R'' is lower alkyl, lower alkenyl or cycloalkyl of 3 to 7 carbon atoms; and
R^6 is hydrogen or lower alkyl.

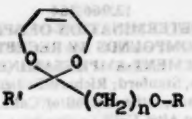
3,966,768

SUBSTITUTED 1,3-DIOXEPINS

Chester E. Pawloski, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 179,215, Sept. 9, 1971, Pat. No. 3,738,997, which is a division of Ser. No. 1,032, Jan. 6, 1970, Pat. No. 3,652,594. This application Jan. 22, 1973, Ser. No. 325,846
Int. Cl.² C07D *321/06*
U.S. Cl. 260—338 **5 Claims**

1. Substituted 1,3-dioxepin compounds corresponding to the formula:



wherein R is a lower alkyl group of from 1 to about 8 carbon atoms, inclusive; R' is hydrogen or a lower alkyl group of from 1 to about 8 carbon atoms, inclusive; and *n* is an integer of from 1 to about 8.

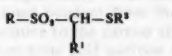
3,966,769

SULFONYL COMPOUNDS

Steffen Piesch, Oberursel, Taunus, and Friedrich Engelhardt, Frankfurt am Main, both of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Division of Ser. No. 259,201, June 2, 1972, Pat. No. 3,882,120. This application Feb. 22, 1974, Ser. No. 444,810
Claims priority, application Germany, June 5, 1971, 2128011
Int. Cl.² C07D *317/56*
U.S. Cl. 260—340.5 **2 Claims**

1. A compound of the formula



wherein R is phenyl, naphthyl, benzyl or phenethyl or one of said moieties substituted on the aromatic moiety thereof by alkyl having 1 to 4 carbon atoms, hydroxy, chlorine, bromine, fluorine, nitro or trifluoromethyl; R^1 is phenyl, naphthyl, benzyl or phenethyl substituted on the aromatic moiety thereof by methylenedioxy and R^2 is alkyl having 1 to 8 carbon atoms substituted by hydroxy.

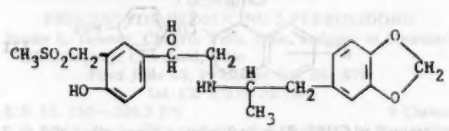
3,966,770

4-HYDROXY-α-[(3,4-METHYLENEDIOXYPHENYL)ISOPROPYLAMINOETHYL]-3-(METHYLSULFONYLMETHYL)BENZYL ALCOHOL

Carl Kaiser, Haddon Heights, N.J., and Stephen T. Ross, Berwyn, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

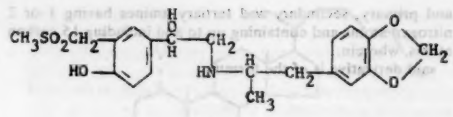
Filed Mar. 25, 1975, Ser. No. 561,828
Int. Cl.² C07D *317/44*
U.S. Cl. 260—340.5 **4 Claims**

1. A chemical compound of the formula:



or a pharmaceutically acceptable acid addition salt of said compound.

2. A pharmaceutical composition having β-adrenergic stimulant activity in dosage unit form comprising a pharmaceutical carrier and a β-adrenergic stimulating effective amount of a chemical compound of the formula:



or a pharmaceutically acceptable acid addition salt of said compound.

3,966,771

5-(4-CHLOROPHENYL)-2-FURYL KETONES

Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed June 16, 1975, Ser. No. 586,877

Int. Cl.² C07D 307/46

U.S. Cl. 260—347.8 **3 Claims**

1. A compound of the formula:

wherein R is cyclopropyl or 2-furyl.

3,966,772

CITRIC ACID DERIVATIVES

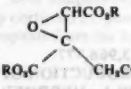
Robert William Guthrie, Fairfield; James Guthrie Hamilton, Nutley; Richard Wightman Kierstead, North Caldwell; O. Neal Miller, Montclair, all of N.J., and Ann Clare Sullivan, New York, N.Y., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 204,334, Dec. 2, 1971, Pat. No. 3,810,931. This application Feb. 13, 1974, Ser. No. 442,258

Int. Cl.² C07D 303/38

U.S. Cl. 260—348 A **3 Claims**

1. A compound of the formula



having the threo-configuration wherein all R groups are hydrogen

and the optical antipodes and pharmaceutically acceptable salts thereof.

3,966,773

2-SUBSTITUTED-3,4-EPOXYCYCLOPENTAN-1-ONES, AND 2-SUBSTITUTED-3,4-EPOXYCYCLOPENTAN-1-OLS

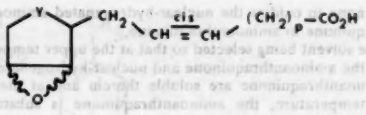
Karel Francis Bernady; Middleton Brawner Floyd, Jr., both of Suffern; John Frank Poletto, Nanuet, all of N.Y.; Robert Eugene Schaub, Upper Saddle River, and Martin Joseph Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 355,101, April 27, 1973, abandoned. This application Aug. 11, 1975, Ser. No. 603,466

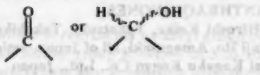
Int. Cl.² C07D 303/38

U.S. Cl. 260—348 C **3 Claims**

1. Compounds of the formula:



wherein *p* is an integer from 2 to 6, inclusive, and Y is a divalent radical of the formulae



3,966,774

PROCESS FOR THE PRODUCTION OF AMINO-ANTHRAQUINONE

Paul Stoll, Basel, and Istvan Toth, Bottmingen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Aug. 6, 1973, Ser. No. 385,757

Claims priority, application Switzerland, Aug. 8, 1972, 17700/72

Int. Cl.² C07C 85/11, 97/24

U.S. Cl. 260—378 **28 Claims**

1. A process for producing an aminoanthraquinone or a diaminoanthraquinone or mixtures thereof from a nitroanthraquinone selected from the group consisting of 1-nitroanthraquinone, 2-nitroanthraquinone, 1,2-dinitroanthraquinone, 1,6-dinitroanthraquinone, 1,7-dinitroanthraquinone, 1,8-dinitroanthraquinone, 1,5-dinitroanthraquinone, 2,7-dinitroanthraquinone, 2,6-dinitroanthraquinone, and mixtures thereof, comprising the steps of:

a. hydrogenating said nitroanthraquinone, suspended or dissolved in an inert solvent selected from the group consisting of a liquid aromatic hydrocarbon, chlorobenzene, a liquid ether and a liquid carboxylic acid ester, with molecular hydrogen in the presence of a metal hydrogenation catalyst selected from the group consisting of noble metal and Raney nickel, at an upper temperature in the range of 50° to 200°C., and at a hydrogen partial pressure of between 0.5 and 15 atmospheres, the weight ratio of solvent to nitroanthraquinone being between 100:1 and 1:2 and the weight of catalyst being between 0.05 and 10% of the weight of nitroanthraquinone, the amount of hydrogen being in excess of the theoretical amount to overhydrogenate the nitroanthraquinone to nuclear-hydrogenated aminoanthraquinone;

b. continuing heating within said upper temperature range for sufficient time to dissolve all of the resulting hydrogenated products;

c. removing the catalyst within said upper temperature range;

d. cooling the reaction mixture to a lower temperature between 40° and 150°C. below said upper temperature, to precipitate the aminoanthraquinone;

e. recovering the precipitated aminoanthraquinone from the reaction mixture containing dissolved nuclear hydrogenated aminoanthraquinone; and

f. reacting the nuclear-hydrogenated aminoanthraquinone with nitroanthraquinone or a hydrogenated derivative thereof of higher oxidative level than aminoanthraqui-

none to oxidize the nuclear-hydrogenated aminoanthraquinone to aminoanthraquinone,

the solvent being selected so that at the upper temperature the aminoanthraquinone and nuclear-hydrogenated aminoanthraquinone are soluble therein and at the lower temperature, the aminoanthraquinone is substantially insoluble therein while the nuclear-hydrogenated aminoanthraquinone is soluble therein.

3,966,775

PROCESS FOR THE PREPARATION OF 1-SUBSTITUTED ANTHRAQUINONES

Akio Fukui, Kyoto; Hiroshi Koike, Takatsuki; Takehiko Tanaka, Kobe, and Yuji Ito, Amagasaki, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Japan

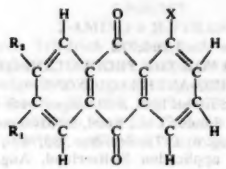
Filed Oct. 25, 1974, Ser. No. 518,209

Claims priority, application Japan, Oct. 26, 1973, 48-119978; Nov. 9, 1973, 48-125422; Jan. 9, 1974, 49-5318; Jan. 10, 1974, 49-5626; May 8, 1974, 49-50276

Int. Cl.² C07C *85/11*, *89/00*

U.S. Cl. 260—378 38 Claims

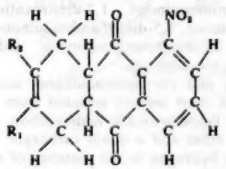
1. A process for the preparation of a 1-substituted anthraquinone having the general formula (I)



(I)

where, in the formula, R_1 and R_2 individually represent a hydrogen atom or methyl group and X represents a hydroxylamino or amino group,

which comprises treating a 5-nitro-1,4,4a,9a -tetrahydroanthraquinone having the general formula (II)



(II)

where, in the formula, R_1 and R_2 individually represent a hydrogen atom or methyl group

in the presence of a basic compound in a liquid medium whereby during the course of the reaction the ring structure is oxidized and the nitro group is partially or completely reduced to provide a product consisting essentially of the 1-substituted anthraquinone of the above general formula (I).

3,966,776

PROCESS FOR PREPARING PARABENZOQUINONES

Takashi Kato, Yokohama; Toru Yamanaka, Kamakura, and Akira Komatsu, Tokyo, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

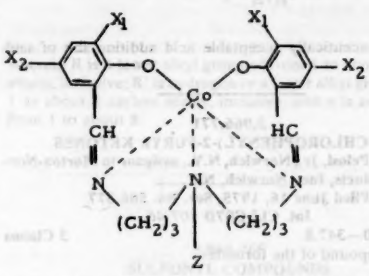
Continuation-in-part of Ser. No. 339,787, March 9, 1973, abandoned. This application Sept. 10, 1974, Ser. No. 504,796

Int. Cl.² C07C *49/64*, *49/66*, *49/68*

U.S. Cl. 260—396 R 13 Claims

1. A process for preparing a parabenzoquinone which comprises oxidizing an alkylphenol with oxygen or oxygen-containing gas in an inert organic solvent in the presence of a cobalt-di-(salcylal)-3,3′-diimino-di-n-propylamine derivative and an amine selected from the group consisting of ammonia and primary, secondary and tertiary amines having 1 or 2 nitrogen atoms and containing up to and including 15 carbon atoms, wherein:

said derivative is of the formula:

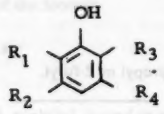


(I)

wherein X_1 and X_2 each represents a hydrogen atom, a halogen atom, an alkyl or alkoxy group having 1 to 3 carbon atoms or a nitro group; and Z represents a hydrogen atom or an alkyl group having 1 to 3 carbon atoms;

reaction is at 10°C to 50°C; and

the alkylphenol is of the formula:



wherein R_1, R_2, R_3 and R_4 are hydrogen or a C_1–C_4 alkyl group, at least 1 of R_1–R_4 being C_1–C_4 alkyl group.

3,966,777

PROCESS FOR THE PRODUCTION OF 1α-HYDROXY PROVITAMIN D_3 AND 1α-HYDROXY VITAMIN D_3

Yehuda Mazur, Tel-Aviv; Dalia Freeman, Rishon Lezion, and Aureliu J. Acher, Ramat-Gan, all of Israel, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

Filed Oct. 15, 1975, Ser. No. 622,647

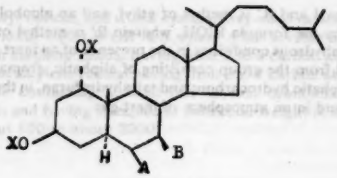
Claims priority, application Israel, Oct. 22, 1974, 45897

Int. Cl.² C07J *9/00*

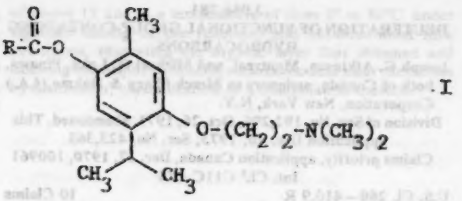
U.S. Cl. 260—397.2 16 Claims

1. Process for the production of 1α-hydroxy provitamin D_3 (1α-hydroxy-7-dehydrocholesterol) which comprises treating 1α,2α-epoxy-cholesta-4,6-dien-3-one, dissolved in a solvent, at a low temperature with liquid ammonia, with ammonium chloride and with lithium metal to result in 1α,3β-dihydroxy-cholest-6-ene, converting this to the corresponding 1α,3β-di(-lower alkanoyloxy)-derivative, reacting the latter with bromine to give 1α,3β-di-lower alkanoyloxy 6β,7α-dibromo-cholestane, which latter is dehydro-brominated with a base to give 1α,3β-di(lower alkanoyloxy)-cholesta-5,7-diene which is converted to the 1α-hydroxy provitamin D_3.

8. A compound of the formula



wherein X is hydrogen or lower alkanoyl,
A—B is a 6(7) double bond or A is —Br and B is —Br.



I

in which R represents an alkyl group of 8 to 11 carbon atoms or an alkoxy group R'—O— of 3 to 10 carbon atoms and the pharmaceutically acceptable salts thereof.

3,966,778

PRODUCTION OF 21-PHOSPHATE CORTICORDS HAVING UNPROTECTED HYDROXYL RADICALS AT LEAST AT THE 17α- AND 21-POSITION

Hirotomo Masuya, Kobe, and Takuichi Miki, Amagasaki, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 160,205, July 6, 1971, abandoned, which is a continuation of Ser. No. 547,779, May 5, 1966, abandoned. This application June 20, 1974, Ser. No. 481,906
Claims priority, application Japan, May 8, 1965, 40-27042; June 9, 1965, 40-34556
Int. Cl.[2] C07J 5/00
U.S. Cl. 260—397.45 19 Claims

1. A process for preparing 17α-hydroxy corticoid 21-phosphate which comprises reacting a compound selected from the group consisting of 17α,21-dihydroxy corticoid and 11,17α,21-trihydroxy corticoid with pyrophosphoryl tetrachloride in the presence of an organic solvent which does not react with the starting materials at a temperature of up to about room temperature, subjecting the reaction mixture to hydrolysis with an aqueous hydrolysis medium at a temperature up to about room temperature, and recovering the objective 17α-hydroxy corticoid 21-phosphate or 11,17α-dihydroxy corticoid 21-phosphate from the hydrolysis reaction medium.

3,966,779

THYMOL DERIVATIVES AND A PROCESS FOR THEIR PREPARATION

Gerhard Satzinger, Denzlingen, and Manfred Franz Herrmann, St. Peter, both of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 356,031, April 30, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,125
Int. Cl.[2] C07C 69/24, 69/26, 69/96
U.S. Cl. 260—404 6 Claims

1. Compounds of the general formula I:

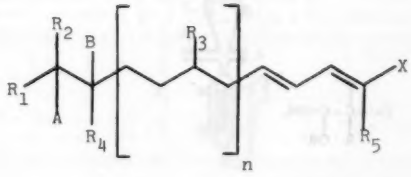
3,966,780

PROPARGYL ESTERS OF 7,11-SUBSTITUTED DODECADIENOIC ACIDS

Madhukar Subraya Chodnekar, Basel; Peter Loeliger; Albert Pfiffner, both of Pfaffhausen; Ulrich Schwieter, Reinach; Milos Suchy, and Rene Zurfluh, both of Pfaffhausen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 8, 1973, Ser. No. 368,135
Claims priority, application Switzerland, June 16, 1972, 9109/72; June 29, 1972, 9744/72
Int. Cl.[2] C07C 69/61; A01N 9/24
U.S. Cl. 260—410.9 N 9 Claims

1. A polyene compound of the formula:



wherein R_1, R_2, and R_3 are methyl; R_4 is hydrogen or lower alkyl of 1–6 carbon atoms, and R_5 is hydrogen; A is individually hydrogen, hydroxy, lower alkoxy of 1–6 carbon atoms or lower alkyl of 1–6 carbon atoms; B is individually hydrogen; or A and B taken together form a carbon to carbon double bond or an oxygen bridge; X is —$COOR_6$ wherein R_6 is propargyl; and n is equal to 1.

3,966,781

DEUTERATION OF FUNCTIONAL GROUP-CONTAINING HYDROCARBONS

Joseph G. Atkinson, Montreal, and Michael O. Luke, Pinawa, both of Canada, assignors to Merck Sharp & Dohme (I.A.) Corporation, New York, N.Y.

Division of Ser. No. 192,296, Oct. 26, 1971, abandoned. This application Dec. 10, 1973, Ser. No. 423,361
Claims priority, application Canada, Dec. 17, 1970, 100961
Int. Cl.² C11C 3/02
U.S. Cl. 260—410.9 R 10 Claims

1. A process for preparing a deuterated, saturated, acyclic hydrocarbon C_{4-18}-alkanoic acid or its ester or amide and having a boiling point of at least 100°C. in its liquid state, which comprises the continuous passage under atmospheric pressure of deuterium gas at a flow rate of at least about 40 ml. per minute through a saturated acyclic hydrocarbon alkanoic acid or its ester or its amide in its liquid state and a catalyst selected from the group consisting of palladium, platinum, rhodium, ruthenium, osmium, iridium, nickel, and rhenium at a temperature between about 100°C. and 300°C. and below the boiling point of said acyclic hydrocarbon acid, ester or amide and continuing the exchange until between 50 and 99.5% of the substrate hydrogen atoms have been replaced by deuterium atoms.

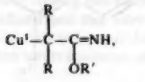
3,966,782

COPPER BASE METALORGANIC COMPOUNDS AND PROCESS FOR THE PREPARATION THEREOF

Gioacchino Cipriani, and Emilio Perrotti, both of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Filed Nov. 15, 1974, Ser. No. 524,311
Claims priority, application Italy, Nov. 21, 1973, 31501/73
Int. Cl.² C07F 1/08
U.S. Cl. 260—438.1 3 Claims

1. A copper base metalorganic compound having the formula



wherein the copper is in the +1 oxidation state, R, the same or different, is a member of the group consisting of hydrogen, methyl, ethyl and phenyl and R′, is methyl or ethyl.

2. The process of preparing the metalorganic compound of claim 1, which consists in reacting a monovalent copper salt having the formula $Cu^{I}X$, wherein X is a monovalent anion selected from the group consisting of halides, ClO_4^- and BF_4^-, with an alkali metal alkoxide in the presence of a mixture of a nitrile represented by the formula RR′CHCN, wherein R is a member of the group consisting of hydrogen, methyl, ethyl and phenyl and R′ is methyl or ethyl, and an alcohol represented by the formula R′OH, wherein R′ is methyl or ethyl, under anhydrous conditions in the presence of an inert solvent selected from the group consisting of aliphatic, aromatic and cycloaliphatic hydrocarbons and tetrahydrofuran, in the liquid phase, and in an atmosphere of inert gas.

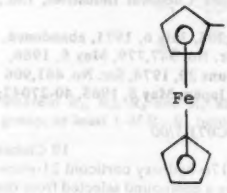
3,966,783

COMPOUNDS

John Louis Suschitzky, and David Rutherford, both of Loughborough, England, assignors to Fisons Limited, London, England

Filed Nov. 11, 1974, Ser. No. 522,593
Claims priority, application United Kingdom, Nov. 21, 1973, 54003/73; July 17, 1974, 31608/74
Int. Cl.² C07F 15/02
U.S. Cl. 260—439 CY 7 Claims

1. A compound of formula I,



in which X is a bivalent saturated hydrocarbon group containing from 2 to 10 carbon atoms inclusive, and
R is C_1 to C_6 alkyl, phenyl, or phenyl substituted by one or more halogen or alkyl groups.

3,966,784

POLYETHER URETHANE FOAM

Bela Prokai, Mahopac, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 334,767, Feb. 22, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,860
Int. Cl.² C07F 7/10, 7/18
U.S. Cl. 260—448.2 N 23 Claims

1. A cyanoalkyl modified siloxane fluid having the average formula

$$(X)_xR_{3-x}SiO(R_2SiO)_y[(X)(R)SiO]_zSiR_{3-x}X,$$

wherein x has a value of 2 to 6 inclusive; y has a value of 0 to 6 inclusive; z has a value of 0 to 1 inclusive; R is a lower alkyl

or phenyl radical; and *X* is a cyanoalkoxy-alkyl radical having the formula $-(O)_nR'OR''CN$ where *n* has a value of 0 or 1, R' is an alkylene radical having from 3 to 8 carbon atoms and R'' is an alkylene radical having from 2 to 4 carbon atoms said siloxane containing at least one of said cyanoalkoxy-alkyl radicals and having an aqueous molecular weight in the range of about 400 to about 2000.

3,966,785

PROCESS FOR THE PREPARATION OF BISPHENOL BISCHLOROCARBONIC ACID ESTERS

Heinrich Krimm, Krefeld; Hermann Schnell, Krefeld-Uerdingen, and Hans-Helmut Schwarz, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

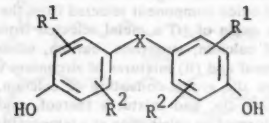
Filed Mar. 4, 1975, Ser. No. 555,148

Claims priority, application Germany, Mar. 6, 1974, 2410668

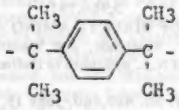
Int. Cl.² C07C *68/00*

U.S. Cl. 260—463 **9 Claims**

1. A continuous process for the preparation of a bisphenol bischlorocarbonic acid ester which comprises reacting a hydroxy compound which is a hydroquinone or an aromatic dihydroxy compound of the formula



wherein X is alkylene, alkylidene, cycloalkylene, cycloalkylidene, O, S, SO_2 or



and R^1 and R^2, which may be the same or different, are each alkyl, chlorine or bromine, said hydroxy compound being dissolved in excess alkali metal hydroxide solution as the sole acid binding agent, with from 2.5 to 5.0 mol, per mol hydroxy compound, of phosgene which is dissolved in a solvent for the bischlorocarbonic acid ester formed in the reaction, at a pH of above 12 and at a temperature of from 0° to 50°C. under vigorous mixing of the reactants and uni-directional flow conditions, separating the organic layer thus obtained and isolating the bisphenol bischlorocarbonic acid ester therefrom by distillation, crystallization or a combination thereof.

3,966,786

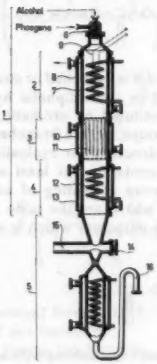
METHOD FOR PRODUCING CHLOROFORMATES

Laszlo Rozsa, Miskolc; Lajos Meszaros, Szeged, and Ferenc Mogyorodi, Miskolc, all of Hungary, assignors to Eszakmagyarorszagi Vegyimuvek, Sajobabony, Hungary

Filed Jan. 28, 1972, Ser. No. 221,504

Int. Cl.² C07C *68/02*

U.S. Cl. 260—463 **13 Claims**



1. In a process for producing a chloroformate by reaction of an alcohol with gaseous phosgene in a reaction zone the improvement which comprises reacting said alcohol in the atomized state.

3,966,787

PROCESS FOR THE PREPARATION OF GRANULAR OR PULVERULENT ORGANIC PEROXIDES

Johannes de Jager, Diepenveen, and Hendrik Hansma, Schalkhaar, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed June 10, 1974, Ser. No. 477,849

Claims priority, application Netherlands, June 14, 1973, 7308250

Int. Cl.² C07C *68/00, 179/14*

U.S. Cl. 260—463 6 Claims

1. A process for preparing a granular or pulverulent diacyl peroxide which is solid at a temperature ranging from −20° to +55°C, which comprises

solidifying a liquid diacyl peroxide with the aid of a liquid cooling medium in which the peroxide is substantially insoluble and which is liquid at a temperature of −20°C or lower, but gaseous at the storage temperature of the diacyl peroxide to be solidified.

3,966,788

PROCESS FOR THE PREPARATION OF ALIPHATIC DIOL POLYCARBONATES

Jean-Pierre G. Senet, Vaux-le-Penil, and Julien C. Deweerdt, Toulouse, both of France, assignors to Societe Nationale des Poudres et Explosifs, France

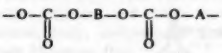
Filed Sept. 24, 1974, Ser. No. 508,754

Claims priority, application France, Oct. 16, 1973, 73.36841

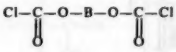
Int. Cl.² C07C *68/00*

U.S. Cl. 260—463 16 Claims

1. A process for preparing telechelating oligomers having two terminal hydroxyl groups of numerical average molecular weight between 250 and 2500, which possess carbonate groups distributed through the macromolecular chain, with the repeating unit of structure



in which each of A and B is branched or straight chain bivalent aliphatic hydrocarbyl or cycloaliphatic hydrocarbyl radical, unsubstituted or substituted by aromatic, halogen or phosphorus-containing groups, or is a branched or straight chain bivalent aliphatic hydrocarbyl or cycloaliphatic hydrocarbyl radical additionally containing at least a functional bridge selected from the group consisting of ether, thioether and ester radicals and A and B are the same or different, which consists of reacting a monomer which is a bis-chloroformate of formula



in which B is as defined hereinabove with an excess of a monomer diol of the formula

HO — A — OH

in which A is as defined hereinabove, in three sequential steps:

1. introducing one of said monomers into the other over a period of 20 minutes up to 4 hours under reduced pressure of 1–10 cm of mercury at a temperature of 20°–80°C while flushing the reaction mixture with a gentle stream of an inert anhydrous gas, and
2. polycondensing the bis-chloroformate with the diol at a temperature below 150°C, under reduced pressure of 1–10 cm of mercury for a period of time between 1.5 hours and 7 hours;
3. and purifying the crude oligomers formed.

3,966,789

N-SUBSTITUTED AMINONITRILE DERIVATIVES

Tadashi Oishi; Nobuyuki Kameda; Toshiro Kato; Akira Fujinami, all of Hyogo; Toshiaki Ozaki, Osaka, and Eiyashi Itooka, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

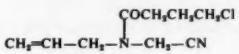
Filed Sept. 5, 1974, Ser. No. 503,425

Claims priority, application Japan, Sept. 5, 1973, 48-100547

Int. Cl.² C07C *121/417*

U.S. Cl. 260—465.4 1 Claim

1. A compound



3,966,790

COMPOSITIONS AND METHODS FOR HIGH TEMPERATURE STABLE CATALYSTS

Saul G. Hindin, Mendham, and George R. Pond, Elizabeth, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Filed Dec. 10, 1973, Ser. No. 423,094

Int. Cl.² B01J *23/16*

U.S. Cl. 252—465 20 Claims

1. A catalyst composition consisting essentially of (a) a catalytically-active, calcined composite of alumina; a first metal oxide component selected from the group consisting of an oxide of chromium, tungsten, and mixtures thereof; and a second metal oxide component selected from the group consisting of an oxide of (i) a metal selected from the group consisting of calcium, strontium, barium, silicon, tin, and mixtures thereof and (ii) mixtures of zirconium with a metal selected from the group consisting of calcium, strontium, barium, silicon, tin, and mixtures thereof, said composite having been formed by calcination at a temperature of at least 500°C. and possessing a surface area of at least 20 m^2/ g when calcined for 2 hours at 1200°C.; and (b) a catalytically-effective amount of a platinum group metal incorporated in said calcined composite after calcination of said composite at a temperature of at least 500°C.

3,966,791

PREPARATION OF DIALKYL AMINO ACRYLONITRILE

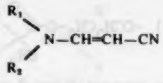
Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 480,660, June 19, 1974, Pat. No. 3,900,511, which is a division of Ser. No. 338,018, March 5, 1973, Pat. No. 3,853,946, which is a division of Ser. No. 197,968, Nov. 11, 1971, Pat. No. 3,742,015, which is a division of Ser. No. 42,528, June 1, 1970, Pat. No. 3,655,716, which is a division of Ser. No. 719,834, April 9, 1968, Pat. No. 3,542,848. This application May 2, 1975, Ser. No. 574,164

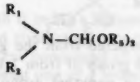
Int. Cl.² C07C *120/00*

U.S. Cl. 260—465.5 R 1 Claim

1. A process for producing a dialkyl amino acrylonitrile compound of the formula:



wherein R_1 and R_2 are lower alkyl containing from 1 to 6 carbon atoms;
comprising condensing acetonitrile at a temperature of from 80°C. to 250°C. with an acetal compound of the formula:



wherein R_1 and R_2 are as above; and R_5 is lower alkyl containing from 1 to 6 carbon atoms;
to form said dialkyl amino acrylonitrile.

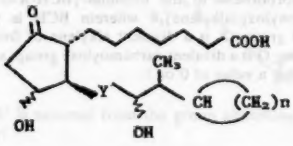
3,966,792

PROSTAGLANDIN COMPOUNDS

Masaki Hayashi; Seiji Kori, both of Takatsuki; Isao Ohyama, Kyoto, and Hirofumi Endo, Fujinomiya, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Filed Feb. 27, 1974, Ser. No. 446,241
Claims priority, application Japan, Feb. 28, 1973, 48-23068
Int. Cl.² C07C *61/38, 69/74*
U.S. Cl. 260—468 D **9 Claims**

1. A compound of the formula:



wherein Y represents trans—CH=CH— or CH_2CH_2—, n represents 4 or 5, and indicates attachment of the hydroxy radical to the carbon atom in alpha or beta configuration, and alkyl esters thereof having from 1 to 12 carbon atoms in a straight- or branched-chain, and cyclodextrin clathrates of such acids and esters, and non-toxic salts of such acids.

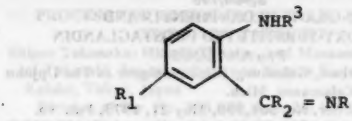
3,966,793

INTERMEDIATES FOR PREPARING 1,4-BENZODIAZEPINE-2-ONES HAVING A CARBOXYLIC ACID ESTER OR AMIDE GROUP IN THE 3-POSITION

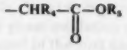
Josef Schmitt, deceased, late of L'Hay-les-Roses, France (by Marcelle Armande Georgette Schmitt, administratrix), assignor to Clin Midy, Paris, France

Continuation-in-part of Ser. No. 739,990, Feb. 19, 1968, abandoned, which is a division of Ser. No. 463,613, June 14, 1965, abandoned. This application Sept. 26, 1973, Ser. No. 401,029
Claims priority, application France, June 15, 1964, 64.978360; Apr. 12, 1965, 65.12886
Int. Cl.² C07C *119/00*
U.S. Cl. 260—471 A **13 Claims**

1. An ortho-aminoaryl ketimine having the formula



in which R is a group having the formula



R_1 is a hydrogen or halogen atom or a trifluoromethyl, loweralkyl, loweralkoxy, nitro or amino group, R_2 is a cyclohexyl, a loweralkyl or a phenyl group, R_3 is a hydrogen atom or a loweralkyl group, R_4 is a hydrogen atom, lowercarbalkoxy, carbamoyl, N-loweralkylcarbamoyl, N,N-di-loweralkylcarbamoyl, N(di-loweralkylaminoalkyl) carbamoyl, loweralkyl group, and R_5 is a loweralkyl group.

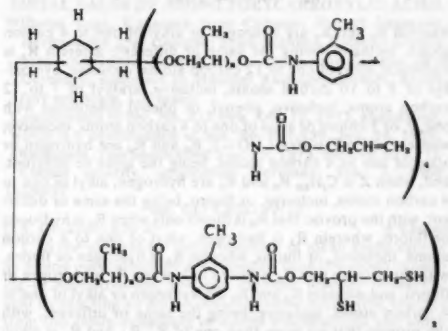
3,966,794

CURABLE POLYENE-POLYTHIOL COMPOUNDS

Donald W. Larsen, Marriottsville, Md., assignor to W. R. Grace & Co., New York, N.Y.

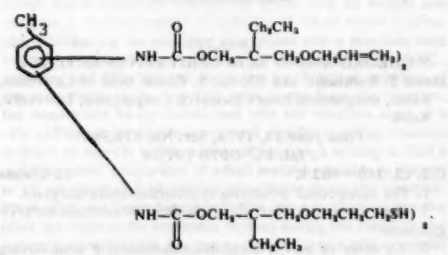
Continuation of Ser. No. 259,148, June 2, 1972, abandoned. This application Sept. 9, 1974, Ser. No. 504,410
Int. Cl.² C07C *125/00*
U.S. Cl. 260—471 C **2 Claims**

1. A compound having the formula



wherein *n* is a numeral from 1 to 2, with *n* being, on the average, about 1.5 per molecule.

2. A compound having the formula:



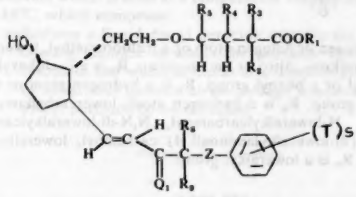
3,966,795

5-OXA-11-DEOXYPHENYL- AND PHENOXY-SUBSTITUTED PROSTAGLANDIN $F_1\alpha$ ANALOGS

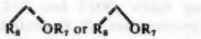
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 361,990, May 21, 1973, Pat. No. 3,864,387. This application Nov. 18, 1974, Ser. No. 524,482
Int. Cl.² C07C *69/76*
U.S. Cl. 260—473 A **17 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 6 carbon atoms, inclusive, between $—CR_8R_9—$ and the ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_{10}$, wherein R_{10} is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different; wherein Q_1 is



wherein R_6 and R_7 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein when Z is oxa (—O—), R_8 and R_9 are hydrogen or alkyl of one to 4 carbon atoms, being the same or different, and, when Z is C_jH_{2j}, R_8 and R_9 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that R_9 is fluoro only when R_8 is hydrogen or fluoro; wherein R_3 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro; wherein R_2 is hydrogen or fluoro, with the proviso that R_2 is fluoro only when R_3 is hydrogen or fluoro; and wherein R_4 and R_5 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different, with the proviso that no more than one of R_3, R_4, and R_5 is alkyl; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,966,796

N-CHLORO-AMINO ACID DERIVATIVES ACTIVITY

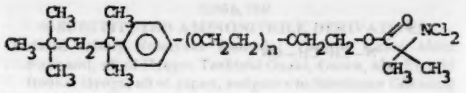
James J. Kaminski, and Nicolae S. Bodor, both of Lawrence, Kans., assignors to Interx Research Corporation, Lawrence, Kans.

Filed June 14, 1974, Ser. No. 479,560
Int. Cl.² C07D *101/10*
U.S. Cl. 260—482 R **12 Claims**

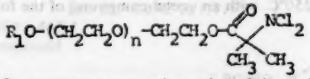
1. The compound: n-hexyl-α-N-chloroaminoisobutyrate.

7. The compound: Methyl-α-N,N-dichloroaminoisobutyrylglycinate.

9. An ester of α-N,N-dichloroaminoisbutyric acid having the formula:



and



wherein R_1 represents a member selected from the group consisting of an n- or branched alkyl group of from 1 to 20 carbon atoms, a phenyl group and a naphthyl group and wherein *n* represents an integer of from 1 – 11.

3,966,797

DINORBORNENES

Henry Octave Colomb, Jr.; David John Trecker, both of South Charleston, and Thomas Kemper Brotherton, Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 759,759, Sept. 13, 1968, Pat. No. 3,658,669. This application May 26, 1971, Ser. No. 147,224
Int. Cl.² C07C *69/66*
U.S. Cl. 260—484 A **3 Claims**

1. A dinorbornene of the formula: [BCH-X-G_a-poly(alkylenecarbonyloxy)alkylene]$_2$0 wherein BCH is the bicycloheptenyl group; X is a divalent alkylene of from 1 to 8 carbon atoms; G is a divalent carbamoyloxy group; and *n* is an integer having a value of 0 or 1.

3,966,798

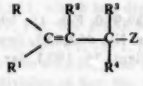
CATALYTIC COUPLING OF ALLYLIC COMPOUNDS TO SUBSTITUTED OLEFINS

George M. Intille, and Gary R. Beck, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 4, 1974, Ser. No. 529,674
Int. Cl.² C07C *69/52*
U.S. Cl. 260—486 R **19 Claims**

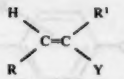
1. A catalytic process for carbon to carbon coupling of allylic compounds with substituted olefins, comprising:

contacting allylic compounds having the formula

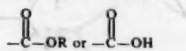


where R, R^1, R^2, R^3, and R^4 are each independently hydrogen, or a hydrocarbyl radical, and Z is hydrogen, chlorine, an alcohol, or —OR group with R having a hydrocarbyl radical; and

substituted olefins having the formula



where R and R¹ are each independently hydrogen or a hydrocarbyl radical and Y is one of



with R being a hydrocarbyl radical;

said contacting occurring in the presence of a catalyst system comprised of a a Group VIII metal component, at least one of a bromine or iodine component, and Group VA component.

3,966,799

ALKYL ESTERS OF 2-METHYL-4-PENTENOIC ACID

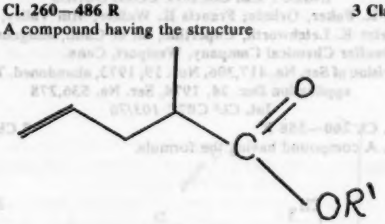
John B. Hall, Rumson; Ching Y. Tseng, Middletown; Manfred Hugo Vock, Locust; Joaquin Vinals, Red Bank, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 490,718, July 22, 1974, Pat. No. 3,907,718. This application May 21, 1975, Ser. No. 579,567

Int. Cl.² C07C *69/52*

U.S. Cl. 260—486 R **3 Claims**

1. A compound having the structure



wherein R' is selected from the group consisting of n-hexyl and i-butyl.

3,966,800

1-CARBOXYMETHYL-3-CHLOROADAMANTANE

Yoshiaki Inamoto, Wakayama; Takeji Kadono, Kainan, and Naotake Takaishi, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 410,508, Oct. 29, 1973, Pat. No. 3,897,479. This application Nov. 29, 1974, Ser. No. 528,399

Claims priority, application Japan, Oct. 30, 1972, 47-108602

Int. Cl.² C07C *61/38*

U.S. Cl. 260—514 G **1 Claim**

1. 1-Carboxymethyl-3-chloroadamantane.

3,966,801

PHENYL BUTYRIC ACIDS AND DERIVATIVES THEREOF

Julius Diamond, Lafayette Hills, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 195,825, Nov. 4, 1971, Pat. No. 3,867,434. This application Dec. 13, 1973, Ser. No. 424,628

Int. Cl.² C07C *63/52*

U.S. Cl. 260—515 A **2 Claims**

1. α-chloro-γ-(p-i-propylphenyl)butyric acid.

3,966,802

PROCESS FOR PREPARING ACRYLIC ACID AND OXIDATION CATALYST

Shigeo Takenaka; Hitoshi Shimizu, and Masanobu Ogawa, all of Takasaki, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 336,058, Feb. 26, 1973, Pat. No. 3,857,796. This application Apr. 19, 1974, Ser. No. 462,310

Claims priority, application Japan, Mar. 9, 1972, 47-23603

Int. Cl.² C07C *51/26*

U.S. Cl. 260—530 N **5 Claims**

1. In the continuous process for preparing acrylic acid by vapor phase oxidation of propylene wherein acrolein is mainly prepared in the first oxidation step and oxidized in the second oxidation step without separating acrolein from by-products or off gas, the improvement which comprises carrying out said second oxidation step with molecular oxygen in the presence of an oxidation catalyst of the empirical formula:

$$Mo_aV_bT_cA_dO_e$$

wherein Mo, V and O represent molybdenum, vanadium and oxygen, respectively, T represents tungsten or antimony, A represents an alkali metal, and a, b, c, d and e represent number of atoms of Mo, V, T, A and O, respectively, and when a is 12, b is 0.5 to 6, c is 0 to 6, d is 0.01 to 1.5 and e is a number naturally determined by the valence requirements of the other elements present, said catalyst being prepared by mixing a water-soluble molybdate, a water-soluble vanadate, a water-soluble salt of an alkali metal and, optionally, tungsten or antimony compound all in the form of aqueous solution or powder, adding, if necessary, a suitable carrier, evaporating the mixture to dryness and calcining the dried mixture at a temperature of from 300° to 500°C.

3,966,803

PROCESS FOR THE MANUFACTURE OF ALKALI METAL SALTS OF AMINO POLYCARBOXYLIC ACIDS

Wilhelm Vogt, Knapsack near Cologne; Hubert Neumaier, Hermulheim near Cologne; Erich Schallus, Cologne-Klettenberg, and Gunter Peantek, Hermulheim near Cologne, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 333,006, Feb. 16, 1973, abandoned, which is a continuation of Ser. No. 791,139, Jan. 14, 1969, abandoned. This application Apr. 25, 1975, Ser. No. 571,771

Claims priority, application Germany, Feb. 2, 1968, 1668927

Int. Cl.² C07C *99/10*

U.S. Cl. 260—534 E **6 Claims**

1. In the process for the production of alkali metal salts of an amino polycarboxylic acid selected from the group consisting of nitrilotriacetic acid and ethylene diamine tetraacetic acid by reacting an amino polycarboxylic acid nitrile selected from the group consisting of nitrilo triacetonitrile and ethylene diamine tetraacetonitrile with aqueous alkali at elevated temperatures, the improvement which consists essentially of suspending the amino polycarboxylic acid nitrile at room temperature in an aqueous alkali metal hydroxide solution which has a minimum strength of about 30% by weight and contains a stoichiometric proportion of alkali metal hydroxide, introducing the resulting suspension into a reaction zone heated to a reaction temperature of between 80° and 120°C., inducing and effecting salt formation by thorough agitation of the suspension in the reaction zone throughout the reaction, the suspension being introduced into the reaction zone at a rate sufficient for the foaming and rapidly reacting reaction mixture to remain within a zone of thorough mixing so that a stoichiometric proportion of alkali metal hydroxide is present in all portions of said mixing zone throughout the reaction, employing the heat evolved during the reaction to remove from the reactor the ammonia formed during the reaction and water present therein, the removal of the water and ammonia being effected continuously at a rate sufficient for the reaction

mixture to remain moist with water or steam during the reaction, and evaporating the resulting moist reaction product substantially to dryness.

3,966,804

METHOD OF PREPARATION OF HYDROXYLAMINE FORMIATE

Andre Bathellier, Sceaux, and Michel Germain, Marcoussis, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 20, 1974, Ser. No. 471,744

Claims priority, application France, May 18, 1973, 73.18165

Int. Cl.² C07C *51/52, 135/00*

U.S. Cl. 260—542 **4 Claims**

1. A method of preparation of hydroxylamine formiate consisting of conducting an anion exchange by continuous extraction of anions between an aqueous solution of a hydroxylamine salt selected from the group consisting of hydroxylamine sulphate, hydroxylamine hydrochloride and hydroxylamine nitrate, and an organic solution of trilaurylamine formiate in accordance with the reaction:

$$NH_2OH \cdot HX_{aq.} + A \cdot HCOOH_{org.} \rightarrow A \cdot HX_{org.} + NH_2OH : HCOOH_{aq.}$$

where A represents the trilaurylamine and X represents the anion of the starting hydroxylamine salt, so as to obtain an aqueous solution of hydroxylamine salt.

3,966,805

N,N'-DIPHENYL-N-(N''-ALKYLCARBAMOYL)FORMAMIDINES

Karl Seckinger, Riegel, Germany, and Fritz Reisser, Therwil, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

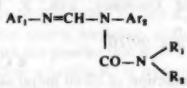
Filed Feb. 23, 1973, Ser. No. 335,050

Claims priority, application Switzerland, Feb. 29, 1972, 2859/72

Int. Cl.² C07C *127/19;* **A01N** *9/20*

U.S. Cl. 260—553 A **37 Claims**

1. A compound of the formula:

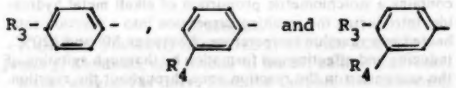


wherein

R_1 is hydrogen or alkyl of 1 to 4 carbon atoms,

R_2 is alkyl of 1 to 4 carbon atoms, and either

Ar_1 and Ar_2 are the same, and are each phenyl or a substituted phenyl group selected from



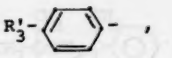
wherein

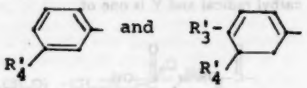
R_3 is chlorine, bromine, methyl or methoxy, and

R_4 is chlorine, bromine, methyl, methoxy or trifluoromethyl, or

Ar_2 is phenyl and

Ar_1 is a substituted phenyl group selected from



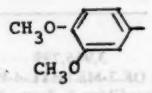


wherein

R_3' is chlorine or methyl and

R_4' is chlorine, methyl or trifluoromethyl,

with the proviso that Ar_1 and Ar_2 are other than



3,966,806

INSECT REPELLENT COMPOUNDS

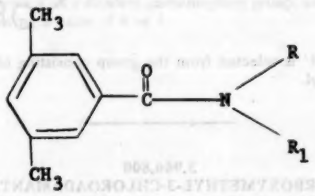
Don R. Baker, Orinda; Francis H. Walker, Mill Valley, and Peter E. Letchworth, Cupertino, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 417,306, Nov. 19, 1973, abandoned. This application Dec. 24, 1974, Ser. No. 536,278

Int. Cl.² C07C *103/76*

U.S. Cl. 260—558 R **7 Claims**

1. A compound having the formula:



wherein R is alkenyl; and R_1 is selected from the group consisting of alkyl, alkenyl and haloalkenyl.

3,966,807

LUBRICANT ADDITIVES, THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

John Scotchford Elliott; Bryan Terence Davis, and Richard Martin Howlett, all of Bracknell, England, assignors to Edwin Cooper & Company Limited, Bracknell, England

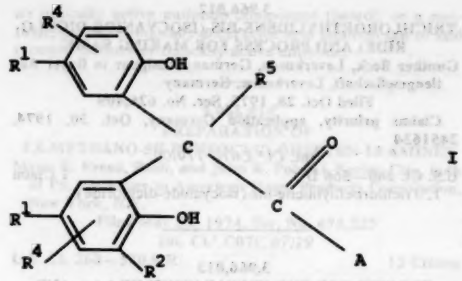
Filed Apr. 18, 1974, Ser. No. 462,092

Claims priority, application United Kingdom, Apr. 19, 1973, 19173/73

Int. Cl.² C07C *103/20*

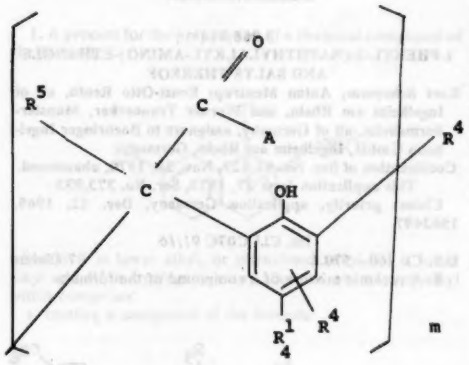
U.S. Cl. 260—559 D **15 Claims**

1. A compound having the formula



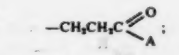
I

wherein each R^1 is sthe same or different and is a hydrogen atom or an alkyl group, provided that at least one is an alkyl group containing at least 30 carbon atoms; R^2 is hydrogen or is a group of the formula



m

in which *m* is zero or an integer; each R^4 is the same or different and is hydrogen or a group of the formula $-Z-R^6$ in which Z is a sulphur atom or a chain of two or more sulphur atoms or is absent and R^6 is an alkyl group or a hydroxy-substituted aralkyl group when Z is absent or a hydroxy-substituted aryl or alkaryl group when Z is present; each R^5 is the same or different and is a hydrogen atom, a methyl group or the group



and each

is the same or different and is an amide group having at least one hydroxyalkyl or aminoalkyl substituent attached to the nitrogen atom, or is an ester group derived from a hydroxy-substituted amine.

3,966,808

MANUFACTURE OF 6-METHYLENETETRACYCLINES

Franco Paolo Luciano, Trezzano sul Naviglio (Milan), Italy, assignor to Rachelle Laboratories Italia, S.p.A., Milan, Italy

Continuation of Ser. Nos. 480,833, June 19, 1974, abandoned, and Ser. No. 192,336, Oct. 26, 1971, abandoned, and a continuation-in-part of Ser. No. 101,688, Dec. 28, 1970, abandoned. This application July 9, 1975, Ser. No. 594,291

Int. Cl.[2] C07C *103/19*

U.S. Cl. 260—559 AT **4 Claims**

1. In a method for the preparation of methacycline hydrochloride which comprises halogenating oxytetracycline hydrochloride to form the corresponding hemiketal base, 11a-halo-5-oxytetracycline-6,12-hemiketal, dehydrating the hemiketal to form the corresponding 11a-halo-6-methylene-5-oxytetracycline, and converting the 11a-halo-6methylene-5-oxytetracycline to methacycline hydrochloride; the improvement comprising

a. halogenating the oxytetracycline hydrochloride in solution at sub-ambient temperatures while maintaining the acidity of the reaction mixture between pH 3.0 and 5 to spontaneously crystallize the 11a-halo-5-oxytetracycline-6,12-hemiketal substantially entirely in the enolic form;

b. reacting the 11a-halo-5-oxytetracycline-6,12-hemiketal base with hydrochloric acid at temperatures of from −10° to 20° C to crystallize the hemiketal hydrochloride, 11a-chloro-5-oxtetracycline-6,12-hemiketal hydrochloride, substantially entirely in the enolic form; and

c. dehydrating the hemiketal hydrochloride rather than the hemiketal base to the corresponding 11a-halo-6-methylene-5-oxytetracycline.

3,966,809

INSECT REPELLENT COMPOUNDS

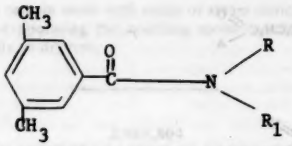
Don R. Baker, Orinda; Francis H. Walker, Mill Valley, and Peter E. Letchworth, Cupertino, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 417,306, Nov. 19, 1973, abandoned. This application Dec. 24, 1974, Ser. No. 536,277

Int. Cl.[2] C07C *103/75*

U.S. Cl. 260—559 R **6 Claims**

1. A compound having the formula:



wherein R is selected from the group consisting of hydrogen and alkoxyalkyl; R_1 is selected from the group consisting of cycloalkenyl and alkoxyalkyl.

3,966,810

PROCESS FOR HYDRATING A NITRILE TO THE CORRESPONDING AMIDE

Tokuzo Kurata, 2-218, Nishimagari, Yahata, Kitakyushu; Takeshi Okano, 3-554-33, Nishiohji, Yahata, Kitakyushu; Akio Tamaru, 3, Sakuradai, Midori, Yokohama; Yozo Kato, 5-1, Tsutsujigaoka, Midori, Yokohama, and Saburo Nagashima, 2-14-46, Saginuma, Takatsu, Kawasaki, all of Japan

Division of Ser. No. 393,291, Aug. 31, 1973. This application June 6, 1975, Ser. No. 584,349

Claims priority, application Japan, Sept. 2, 1972, 47-88217; Sept. 4, 1972, 47-88531; Feb. 14, 1973, 48-18195

The portion of the term of this patent subsequent to Dec. 30, 1992, has been disclaimed.

Int. Cl.² C07C *103/08*

U.S. Cl. 260—561 N 15 Claims

1. A process for preparing an amide, which comprises: hydrating a nitrile to the corresponding amide in the presence of a copper metal catalyst obtained by decomposing copper hydride in the presence of a promoter compound containing the element chromium.

3,966,811

DIALKYL ACETALS OF ANILINOACETALDEHYDES

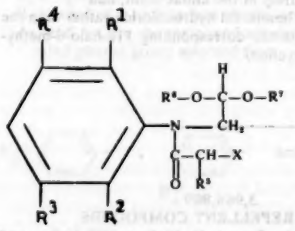
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Dec. 19, 1974, Ser. No. 530,797

Int. Cl.² C07C *103/32*

U.S. Cl. 260—562 B 8 Claims

1. A compound of the formula



wherein R^1, R^6 and R^7 are each alkyl; R^2 is selected from the group consisting of hydrogen, alkyl, alkoxy and trifluoromethyl; R^3 and R^4 are each selected from the group consisting of hydrogen, lower alkyl, halogen, cyano, alkoxy, alkylthio, haloalkyl and alkoxyalkyl; R^5 is selected from the group consisting of hydrogen and alkyl; and X is halogen.

3,966,812

TRICHLOROETHYLIDENE-BIS-(ISOCYANIDE-DICHLORIDE) AND PROCESS FOR MAKING SAME

Gunther Beck, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 28, 1975, Ser. No. 626,409

Claims priority, application Germany, Oct. 30, 1974, 2451634

Int. Cl.² C07C *119/00*

U.S. Cl. 260—566 D 1 Claim

1. Trichloroethylidene-bis-(isocyanide-dichloride).

3,966,813

PROCESS FOR THE PREPARATION OF 1-(m- AND p-HYDROXYPHENYL)-2-AMINOETHANOL

Gerhard Satzinger, and Wolfgang Dieter Herrmann, both of Denzlingen, Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed June 20, 1972, Ser. No. 264,698

Claims priority, application Germany, June 21, 1971, 2130710

Int. Cl.² C07C *85/11*

U.S. Cl. 260—570.6 5 Claims

1. A two-step process for the preparation of 1-(hydroxyphenyl)-2-aminoethanol which comprises:

A. reacting in a dipolar aprotic solent, hydroxyacetophenone with a lower alkyl nitrite in the presence of a hydrogen chloride catalyst, to form isonitrosoacetophenone, and

B. catalytically reacting the isonitrosoacetophenone with palladium to cause hydrogenation and bring about the reduction of the isonitroso and keto moieties on the isonitrosoacetophenone molecule.

3,966,814

1-PHENYL-2-(NAPHTHYLALKYL-AMINO)-ETHANOLS AND SALTS THEREOF

Kurt Schromm; Anton Mentrup; Ernst-Otto Renth, all of Ingelheim am Rhein, and Werner Traunecker, Munster-Sarmsheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

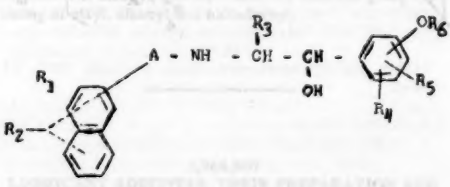
Continuation of Ser. No. 92,527, Nov. 24, 1970, abandoned. This application June 27, 1973, Ser. No. 373,933

Claims priority, application Germany, Dec. 12, 1969, 1962497

Int. Cl.² C07C *91/16*

U.S. Cl. 260—570.6 7 Claims

1. A racemic mixture of a compound of the formula



wherein

A is alkylene of 2 to 6 carbon atoms,

R_1 is hydrogen, lower alkyl, lower alkoxy or hydroxyl,

R_2 is hydrogen, lower alkyl or lower alkoxy,

R_3 is hydrogen, methyl or ethyl,

R_4 is hydrogen, lower alkyl or lower alkoxy,

R_5 is hydrogen or hydroxyl, and

R_6 is hydrogen,

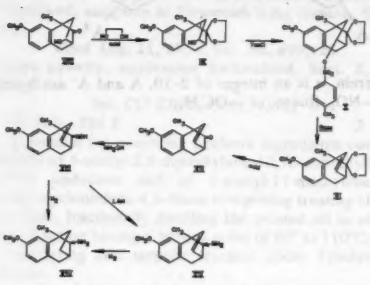
an optically active antipode component thereof, or a non-toxic, pharmacologically acceptable acid addition salt of said racemic mixture or optically active antipode.

3,966,815

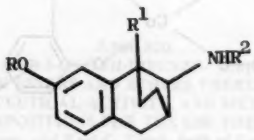
PREPARATION OF 5,8-METHANO-5H-BENZOCYCLOHEPTEN-10-AMINES

Meier E. Freed, Paoli, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed May 31, 1974, Ser. No. 475,223
Int. Cl.² C07C 87/29
U.S. Cl. 260—570.8 R 12 Claims

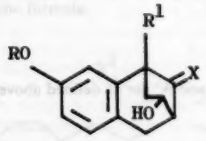


1. A process for the preparation of a chemical compound of the formula:



wherein R is lower alkyl, or phen(lower)alkyl; R^1 is lower alkyl and R^2 is hydrogen, lower alkyl, or phen(lower)alkyl which comprises:

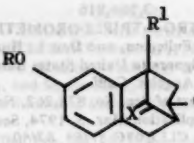
a. treating a compound of the formula:



wherein R and R^1 are as defined hereinabove; and X is a ketone protecting group from the group ethylene ketal, an ethylene hemithioketal, an ethylene dithioketal, or a semicarbazide; with a compound of the formula:

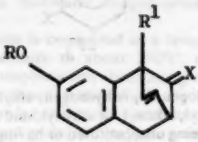
$A—SO_2Y$

wherein A is halo, and Y is straight or branched chain alkyl of from 1 to 10 carbon atoms, cycloalkyl of from 1 to 10 carbon atoms, or carbocyclic aryl; to produce a compound of the formula:



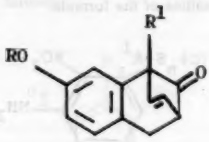
wherein R, R^1, X and Y are as defined hereinabove;

b. treating the product of step (a) above with base in the presence of an inert solvent at about 60° to about 65°C. to produce a compound of the formula:



wherein R, R^1, and X are as defined hereinabove;

c. removing the protecting group from the ketone function of the product of step (b) to produce a compound of the formula:

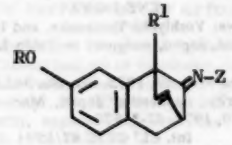


wherein R and R^1 are as defined hereinabove;

d. treating the product of step (c) above with a compound of the formula:

$H_2N—Z$

wherein Z is hydrogen, hydroxyl, lower alkyl, or phen(lower)alkyl; to form a compound of the formula:



wherein R, R^1 and Z are as defined hereinabove; and

e. reducing the imino function and non-aromatic unsaturation of the product of step (d) above by subjecting said product of step d to catalytic hydrogenation, or by reducing said product of step d with a metal hydride reducing agent or with sodium dissolving in alkanol followed by catalytic hydrogenation.

3,966,816

3-HALO-2,6-DINITRO-4-TRIFLUOROMETHYLANILINE

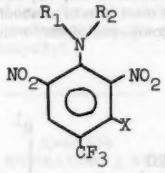
William G. Woods, Fullerton, and Don L. Hunter, Anaheim, both of Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 878,262, Nov. 19, 1969, abandoned. This application Mar. 5, 1974, Ser. No. 448,322

Int. Cl.² C07C 87/58, 87/60

U.S. Cl. 260—573 10 Claims

1. A compound of the formula



wherein X is halogen, R_1 is hydrogen, alkyl, alkenyl, or alkynyl, and R_2 is alkyl, alkenyl, or alkynyl, said alkyl, alkenyl, and alkynyl groups being unsubstituted or having halo, hydroxy, or lower alkoxy substituents.

3,966,817

HERBICIDAL ORTHO-NITROANILINES

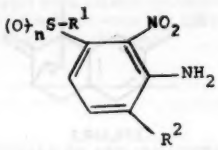
Kurt H. G. Pilgram, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 25, 1974, Ser. No. 454,185

Int. Cl.² C07C 87/50

U.S. Cl. 260—578 2 Claims

1. An o-nitroaniline of the formula:



wherein

a. R^1 is methyl, R^2 is chlorine and $n = 0$, 1 or 2;
b. R^1 is ethyl, R^2 is chlorine and $n = 1$;
c. R^1 is propyl, R^2 is chlorine or methyl, and $n = 1$; and
d. R^1 is iso-butyl, R^2 is chlorine or methyl and $n = 0$, 1 or 2.

3,966,818

NOVEL PROCESS FOR PREPARATION OF 4-HYDROXY-2,4,6-TRIMETHYL-2,5-CYCLOHEXADIENE-1-ONE

Yataro Ichikawa; Yoshiyuki Yamanaka, and Hideki Tsuruta, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

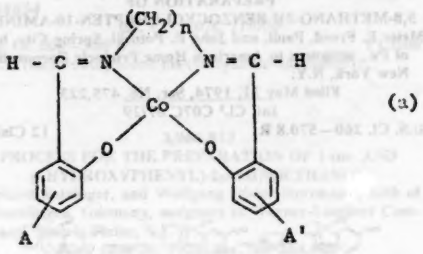
Filed Mar. 19, 1973, Ser. No. 342,500

Claims priority, application Japan, Mar. 25, 1972, 47-30160; Mar. 30, 1972, 47-31920

Int. Cl.² C07C 45/16

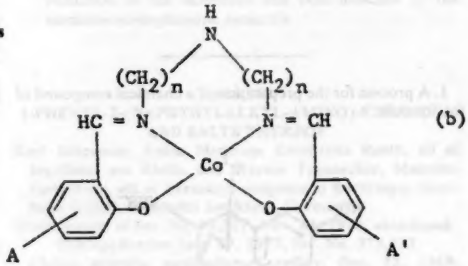
U.S. Cl. 260—586 P 22 Claims

1. A process for preparing 4-hydroxy-2,4,6-trimethyl-2,5-cyclohexadiene-1-one comprising reacting a phenol which is 2,4,6-trimethyl phenol, alkali metal 2,4,6-trimethyl phenolate, or alkaline earth metal 2,4,6-trimethyl phenolate, with molecular oxygen or a molecular oxygen-containing gas at an oxygen partial pressure of at least .1 Kg/cm² and at a temperature of from −20° to +200°C., and optionally in the presence of an inert liquid reaction medium having a pH of at least 5 selected from one of the group consisting of water, an inert organic liquid, or a mixture thereof, in the absence of a catalyst or in the presence of a catalyst selected from the group consisting of cobalt complexes represented by the following formulas (a), (b) and (c)



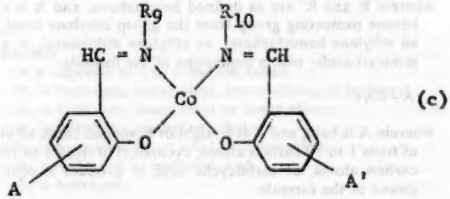
(a)

wherein, n is an integer of 2–10, A and A′ are hydrogen, $-NO_2$, fluoro, or $-OC_2H_5$,



(b)

wherein n, A, and A′ are as defined above, and



(c)

wherein, R_9 and R_{10} are hydrogen, phenyl, alkyl, —OH, hydroxyalkyl, or benzyl, A and A′ are as defined above; cobalt-di(salycylal) ethylenediimine-pyridine; cobalt-phthalocyanine; or cobalt-acetylacetone.

3,966,819

SESQUITERPENIC DERIVATIVES AS ODOR- AND TASTE MODIFYING AGENTS

Karl-Heinrich Schulte-Elte, Onex-Geneva; Michel Joyeux, Carouge-Geneva, and Günther Ohloff, Bernex-Geneva, all of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Filed Aug. 21, 1974, Ser. No. 499,120

Claims priority, application Switzerland, Sept. 5, 1973, 12784/73

Int. Cl.² C07C *45/02, 49/61*

U.S. Cl. 260—586 F 3 Claims

1. A process for preparing perfume ingredients consisting essentially of 5-acetyl-2,6-dimethylene-10,10-dimethylbicyclo [7.2.0^{1,9}] undecane and of 1-acetyl-11-methylene-4,7,7-trimethyl-cycloundeca-4,8-diene comprising treating clove oil with a base, fractionally distilling the treated oil to obtain a terpene fraction having a boiling point of 80° to 110°C/2 Torr and acetylating said terpene fraction under Friedel-Crafts conditions.

3. 5-Acetyl-2,6-dimethylene-10,10-dimethylbicyclo [7.2.0^{1,9}]undecane.

3,966,820

2-SUBSTITUTED-5-OXO-5H-DIBENZO- [a,d] CYCLOHEPTENES, THE ESTERS AND ETHERS THEREOF, HAVING PHARMACEUTICAL ACTIVITY, AND METHODS AND COMPOSITIONS FOR THE USE THEREOF

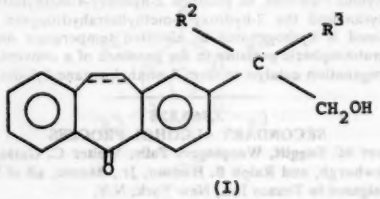
Peter H. Nelson, and Karl G. Untch, both of Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 486,038, July 5, 1974, abandoned. This application May 30, 1975, Ser. No. 581,501

Int. Cl.² C07C *49/76*

U.S. Cl. 260—590 FB 19 Claims

1. A compound selected from the group of compounds represented by the formula:



(I)

where one of R^2 and R^3 is hydrogen and the other is hydrogen, methyl, or ethyl, or together R^2 and R^3 are methylene; the dotted line refers to an optional, additional bond between the carbon atoms at the 10- and 11-positions.

3,966,821

PROCESS FOR PREPARING 1-TETRAHYDRONAPHTHALONE

Ken-Ichi Kudo, Niihama; Tadayuki Ohmae, Kobe; Yoshiki Toyoshima, and Sumio Hara, both of Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 26, 1975, Ser. No. 553,200

Claims priority, application Japan, Feb. 26, 1974, 49-23150

Int. Cl.² C07C *49/76*

U.S. Cl. 260—590 R 2 Claims

1. In a process for preparing 1-tetrahydronaphthalone by a liquid phase oxidation of tetrahydronaphthalene with molecular oxygen or a molecular oxygen containing gas in the presence of a catalyst, wherein

a. said molecular oxygen or said molecular oxygen containing gas is used in a proportion of about 0.01 to about 10 based on a molecular oxygen/tetrahydronaphthalene molar ratio;

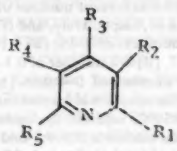
b. said oxidation is conducted at a temperature of about room temperature to about 250°C. under a pressure between atmospheric and about 20 kg/cm² for a period of about 0.2 to about 10 hours; and

c. said oxidation is conducted by introducing said molecular oxygen or said molecular oxygen containing gas into a solution of said catalyst in tetrahydronaphthalene in a batch manner or a continuous manner;

the improvement comprising conducting said liquid phase oxidation in the presence of a catalyst system consisting essentially of

a. chromic naphthenate, chromous naphthenate or a mixture thereof in a concentration of about 0.1 to about 500 ppm in the tetrahydronaphthalene calculated as chromium ion, together with

b. an alkyl-substituted pyridine compound represented by the formula,



wherein R_1, R_2, R_3, R_4 and R_5, which can be the same or different, each represents a hydrogen atom or an alkyl group having 1 to 5 carbon atoms and at least one of R_1, R_2, R_3, R_4 and R_5 is an alkyl group, said pyridine compound being present in a concentration of about 0.1 to about 10 mol % in tetrahydronaphthalene.

3,966,822

CATALYTIC PREPARATION OF KETONES FROM ALDEHYDES

Masahiro Fukui; Shigeru Hayashi; Takehiko Okamoto; Isao Koga, and Takeshi Inoi, all of Yokohama, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Apr. 27, 1972, Ser. No. 248,133

Claims priority, application Japan, May 19, 1971, 46-33774; Jan. 19, 1972, 47-7438

Int. Cl.² C07C *45/00*

U.S. Cl. 260—593 R 5 Claims

1. A decarboxylation process which consists essentially of contacting two mols of an aldehyde of the formula R_1CHO or one mol of an aldehyde of the formula R_1CHO and one mol of the formula R_2CHO wherein R_1 and R_2 are different alkyl groups, in the vapor phase and in the presence of water with a catalyst in an amount effective to produce a ketone of the formula R_1COR_1 or R_1COR_2

said aldehydes R_1CHO and R_2CHO being selected from the group consisting of acetaldehyde, propionaldehyde, N-butyraldehyde, isobutyraldehyde, valeraldehyde, caproic aldehyde, heptaldehyde caproylaldehyde, 2-ethylhexyl aldehyde, pelargonic aldehyde, capric aldehyde and mixtures thereof,

said catalyst being selected from the group consisting of:

a. 100% zirconium oxide

b. Zirconium oxide and an alkali metal oxide, and

c. zirconium oxide and an alkaline earth metal oxide,

said elevated temperature being within the range of 200° – 600°C.

3,966,823

PROCESS FOR PREPARING 1,3-BUTADIENE AND METHACROLEIN SIMULTANEOUSLY

Shigeo Takenaka; Hitoshi Shimizu, and Kenichiro Yamamoto, all of Takasaki, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1971, Ser. No. 194,501

Claims priority, application Japan, Nov. 7, 1970, 45-97548

Int. Cl.² C07C *45/04*

U.S. Cl. 260—604 R **5 Claims**

1. The process for preparing 1,3-butadiene and methacrolein simultaneously by reacting butene mixture containing n-butenes and isobutylene with molecular oxygen in the presence of steam and a catalyst of the empirical formula;

$$Ni_aCo_bFe_cBi_dL_eM_fMo_gO_h$$

wherein Ni, Co, Fe, Bi, Mo and O are the chemical symbols of the corresponding elements, L represents at least one element selected from the group consisting of phosphorus, arsenic and boron, M represents at least one element selected from the group consisting of potassium, rubidium and cesium, *a*, *b*, *c*, *d*, *e*, *f*, *g* and *h* represent number of atoms of Ni, Co, Fe, Bi, L, Mo, O and M, respectively, and (f) is 12, (*a*) and (*b*) independently are numbers of 0–15, (a) + (b) being 1–15, (c) is a number of 0.5–7, (d) is a number of 0.1–4, (g) is a number of 36–98 (e) is a number of 0–4 and (h) is a number of 0.01–1.0, wherein the reaction is carried out at a temperature of from 250°C to 450°C, wherein the molar ratio of oxygen, per one mole of total olefins is 0.5–4:1 and the molar ratio of steam per one mole of total olefins is 1–20:1 and wherein the reaction is carried out under a pressure of 0.5–10 atmospheres absolute.

3,966,824

p,p′-DISUBSTITUTED α-TRICHLOROMETHYLBENZYLPHENYL ETHERS

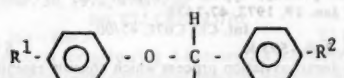
Robert L. Metcalf; Inder Kapoor, and Asha Hirwe, all of Urbana, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Division of Ser. No. 318,206, Dec. 26, 1972, Pat. No. 3,894,092. This application Nov. 29, 1974, Ser. No. 528,351

Int. Cl.² C07C *43/20*

U.S. Cl. 260—612 R **5 Claims**

1. Insecticides having the formula



where R^1 and R^2 are selected from the group consisting of substituents Cl, CH_3, CH_3O, and C_2H_5O, provided that at least one of R^1 and R^2 in Cl or CH_3.

3,966,825

PROCESS FOR PREPARING β-NITROETHANETHIOL

Michael Marx, Sunnyvale, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed June 30, 1975, Ser. No. 591,596

Int. Cl.² C07C *149/14*

U.S. Cl. 260—609 R **8 Claims**

1. The process for preparing β-nitroethanethiol which comprises reacting a carboxylic acid ester of β-nitroethanol with trisodium thiophosphate followed by acid hydrolysis of the resulting phosphate ester of β-nitroethanethiol.

3,966,826

PHENYL ETHERS

Jürgen Trösken, Walldorf, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

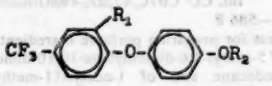
Filed July 8, 1975, Ser. No. 594,119

Claims priority, application Germany, July 10, 1974, 2433066

Int. Cl.² C07C *43/22*

U.S. Cl. 260—613 R **1 Claim**

1. Diphenyl ethers of the formula



I

wherein R_1 is hydrogen or halogen and R_2 is hydrogen or an alkali metal or ammonium cation.

3,966,827

PRODUCTION OF 3-METHYLPENTANE-1,5-DIOL

Werner Aquila, Mannheim; Walter Himmele, Walldorf; Werner Fliege, Otterstadt, and Hardo Siegel, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 16, 1975, Ser. No. 541,638

Claims priority, application Germany, Jan. 30, 1974, 2404312

Int. Cl.² C07C *29/00*

U.S. Cl. 260—635 E **13 Claims**

1. A process for the production of 3-methylpentane-1,5-diol wherein 2-methylbut-1-en-4-ol is reacted with carbon monoxide and hydrogen at 60–140°C and at 10–700 atmospheres pressure at a ratio by volume of CO to H_2 in the range of 1:0.25 to 1:4 in the presence of a rhodium carbonyl complex which has been modified with at least three mols of a tertiary organic phosphine per gram atom of rhodium, the organic groups of said tertiary phosphine being selected from the group consisting of alkyl having 1–20 carbon atoms, cycloalkyl having 5–8 carbon atoms, phenyl, phenyl bearing 1–2 alkyl groups, each having 1–4 carbon atoms, and phenyl bearing 1–2 alkoxy groups, each having 1–4 carbon atoms, said rhodium complex catalyst being present in an amount of 0.5 to 500 ppm, calculated as rhodium metal and based on the 2-methylbut-1-en-4-ol, to produce 2-hydroxy-4-methyltetrahydropyran and the 2-hydroxy-4-methyltetrahydropyran thus obtained is hydrogenated at elevated temperature and at superatmospheric pressure in the presence of a conventional hydrogenation catalyst to form 3-methylpentane-1,5-diol.

3,966,828

SECONDARY ALCOHOL PROCESS

Robert M. Suggitt, Wappingers Falls; Walter C. Gates, Jr., Newburgh, and Ralph B. Hudson, Jr., Beacon, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 428,508, Dec. 26, 1973. This application Dec. 13, 1974, Ser. No. 532,352

Int. Cl.² C07C *29/12*

U.S. Cl. 260—639 B **12 Claims**

1. In a process for producing secondary alcohols from C_6 to C_{30} n-paraffins wherein a portion of said n-paraffin is con-

verted to a borate ester along with oxygenated by-products, wherein said borate ester is separated from a mixture of unreacted paraffin, olefin and oxygenated by-products and where said borate ester is hydrolyzed to said secondary alcohol, the improvement which comprises:

a. catalytically hydrogenating said mixture at a temperature of from about 600° to 750°F. in the presence of a catalyst composed of alumina and a Group VIII metal and from about 10 to 5000 parts per million of nitrogen present as ammonia or an organonitrogen compound selected from the group consisting of monoalkylamines, dialkylamines, trialkylamines, nitriles and alkenylpolyamines basis said paraffin mixture; and

b. recycling said hydrogenated product of (a) for conversion with said n-paraffin to said borate ester.

3,966,829

METHOD OF PURIFYING MONOALCOHOLS

Friedrich Engelhardt, Hamburg; Karl Erhard, Buchholz, and Gündolf Füchs, Steinbeck-Meilsen, all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Continuation-in-part of Ser. No. 463,080, April 22, 1974, abandoned, which is a continuation of Ser. No. 873,739, Nov. 26, 1969, abandoned, which is a continuation of Ser. No. 638,742, May 16, 1967, abandoned. This application Sept. 27, 1974, Ser. No. 509,873

Claims priority, application Germany, Sept. 24, 1966, 1568415

Int. Cl.² C07C *29/24*

U.S. Cl. 260—643 B **17 Claims**

1. A process for selectively converting a secondary alkanediol in admixture with a primary monoalkanol to a primary monoalcohol without appreciably effecting dehydration of said primary monoalkenol, which comprises passing a mixture of secondary alkanediol and primary monoalkanol at a temperature of from about 170° to 220°C in the liquid phase over a dehydrating agent consisting essentially of a gamma-alumina catalyst.

3,966,830

PROCESS FOR THE NITRATION OF HALOGENATED BENZENE DERIVATIVES

Keizo Shimada; Takeo Nishikawa, both of Hino; Toshiaki Harada, Hachioji, and Shizuo Nagahama, Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

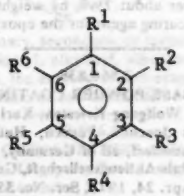
Filed Nov. 12, 1974, Ser. No. 523,049

Claims priority, application Japan, Mar. 8, 1974, 49-26340; Mar. 23, 1974, 49-32221; Mar. 23, 1974, 49-32222

Int. Cl.² C07C *79/12*

U.S. Cl. 260—646 **7 Claims**

1. A process for nitrating halogenated benzene derivatives which comprises reacting in the vapor phase a halogenated benzene derivative represented by the formula:



wherein R^1 is a halogen atom, R^4 is a hydrogen atom, and R^2, R^3, R^5, and R^6, independently represent a member selected from the class consisting of a hydrogen atom, a halogen atom and an alkyl group, at least one of R^1, R^3, R^5 and R^6 being a hydrogen atom, the total number of halogen atoms including R^1 being not more than 3; with the provisos that when there is one halogen atom and both R^3 and R^6 are alkyl groups, R^2 is a hydrogen atom; when there are two halogen atoms and R^2 is a halogen atom, R^2 is a hydrogen atom; when there are two halogen atoms and R^2 is a halogen atom, at least one of R^3 and R^6 is a hydrogen atom; when there are three halogen atoms, R^2 is a halogen atom and R^5 is a hydrogen or a halogen atom; and when there are at least two halogen atoms including R^1, the substituent halogen atoms are substituted at positions such that the sum of the numbers 1 to 6 showing the substituting positions attached to the inside of the benzene ring in the above formula becomes a minimum; with at least one member selected from the group consisting of nitric acid, nitrogen dioxide and nitrogen pentoxide in the presence of at least one solid inorganic oxide selected from the group consisting of silica, alumina and silica-alumina.

3,966,831

PRODUCTION OF BROMOSTYRENES

Moshe Levy; David Vofsi; Stephen Daren, all of Rehovot, and Ella Cohen, Ramat-Hasharon, all of Israel, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 376,171, July 3, 1973. This application Feb. 7, 1975, Ser. No. 547,861

Claims priority, application Israel, July 26, 1974, 45356

Int. Cl.² C07C *25/28*

U.S. Cl. 260—650 R **7 Claims**

1. A process for the production of a compound selected from the group consisting of monobromostyrene, dibromostyrene and tribromostyrene, said process comprising reacting β-bromoethyl-monobromobenzene, β-bromoethyl-dibromobenzene and β-bromoethyl-tribromobenzene, respectively, with a lower alkanol or water, at a temperature between 280°C. and 470°C. in the presence of a chemical source of free radicals.

3,966,832

CONTINUOUS PROCESS FOR PREPARING DERIVATIVES OF BENZENE WITH FLUORINATED SIDE CHAINS FROM THE CORRESPONDING CHLORINE COMPOUNDS

Rudolf Lademann, Kelkheim, Taunus; Helmut Lindner, Hofheim, Taunus; Thomas Martini, Neuenhain, Taunus, and Peter Paul Rammelt, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 7, 1974, Ser. No. 521,894

Claims priority, application Germany, Nov. 10, 1973, 2356257

Int. Cl.² C07C *25/14, 17/20*

U.S. Cl. 260—651 F **13 Claims**

1. In a process for the preparation of the derivative of benzene containing at least one trifluoromethyl group by reaction of the corresponding trichloromethyl compound with liquid hydrogen fluoride, by subsequently distilling the reaction products under pressure thus eliminating the newly formed hydrogen chloride, and by subsequently isolating the remaining reaction products, the improvement for continuous processing which comprises continuously feeding the reactants into a reaction zone under an effective pressure in excess of 20 absolute atmospheres to maintain a sufficiently homogeneous reaction mixture to solubilize the reactants, with the hydrogen fluoride reactant being in at least a 25 mol % excess as compared to the stoichiometric proportion, blending said mixture in said zone by means limited to the agitation caused by the pressurized feeding of the reactants into said zone, withdrawing the reaction products from said zone proportionately to the feeding-in rate of the reactants, said reaction zone being maintained in a reaction temperature range of above 80° to about 150°C, said reaction having been initiated by precharging said zone with liquid hydrogen fluoride alone or in homogeneous mixture with said trichloromethyl compounds and hydrogen chloride to a pressure of at least 20 atmospheres.

3,966,833

PROCESS FOR HYDRODEALKYLATING ALKYLAROMATIC HYDROCARBONS

Jean Cosyns, Nanterre; Bernard Juguin; Jean-Francois Le Page, both of Rueil-Malmaison, and Jean Miquel, Paris, all of France, assignors to Institut Francaise du Petrole, Rueil-Malmaison, France

Filed Dec. 13, 1974, Ser. No. 532,618

Claims priority, application France, Dec. 13, 1973, 73.44690

Int. Cl.² C07C *3/58*

U.S. Cl. 260—672 R 11 Claims

1. In a process for the catalytic hydrodealkylation of alkyl aromatic hydrocarbons, conducted at a temperature from 400° to 650° C, under a pressure from 1 to 30 kg/cm² at a space velocity from 1 to 10 and a ratio of hydrogen to the hydrocarbons, expressed in mole per mole of the effluent at the outlet of the reactor, in the range from 1 to 10, wherein the improvement comprises employing a catalyst containing essentially:

a. at least one metal selected from the group consisting of ruthenium, osmium, palladium, rhodium, iridium, platinum and manganese, and

b. an alumina, substantially inert to cracking and coking reactions in the presence of hydrogen, the metal content by weight of the catalyst being from 0.05 to 5%, the specific surface of the catalytst being from 1 to 100 m²/g., the total pore volume of the catalyst being from 0.2 to 0.8 cc/g and the heat of neutralization of the catalyst by ammonia adsorption being lower than 10 calories per gram of catalyst at 320° C under a pressure of 300 mm of Hg.

3,966,834

PROCESS FOR THE SEPARATION OF DIENE FROM ORGANIC MIXTURES

Eli Perry, St. Louis, and William F. Strazik, St. Ann, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 22, 1972, Ser. No. 291,453

Int. Cl.² C07C *7/00*

U.S. Cl. 260—681.5 R 8 Claims

1. A process for separating dienes from an organic mixture comprising dienes having from 4 to 8 carbon atoms per molecule and alkenes having one double bond and from 3 to 12 carbon atoms per molecule which comprises:

contacting the mixture against a first side of a membrane which is selected from the group consisting of poly (vinyl chloride), poly (vinyl fluoride), poly (vinylidene fluoride), tetrafluoroethylene/ethylene copolymer, vinyl chloride/ethylene copolymer, and vinylchloride/vinylacetate copolymer; and withdrawing from a second side of the membrane a vaporous mixture having a higher concentration of dienes than the aforesaid organic mixture with the mixture at the second side being maintained at a lower chemical potential than the mixture on the first side of the membrane.

3,966,835

PERMANENTLY ANTISTATIC POLYAMIDE COMPOSITIONS

Geert Christoph; Eduard Radlmann; Günther Nischk; Ludwig Bruns, and Günther Schnuchel, all of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 22, 1972, Ser. No. 317,670

Claims priority, application Germany, Dec. 23, 1971, 2164307

Int. Cl.² C08L *63/00*

U.S. Cl. 260—830 P 6 Claims

1. A permanently anti-static polyamide composition comprising an aliphatic polyamide and from 0.5 to 40% by weight based on the polyamide composition of a substantially water-insoluble high-molecular weight polyalkylene oxide dispersed in the polyamide and obtained by the copolymerization of a mono-epoxide with a di- or tri-epoxide.

3,966,836

PULVERULENT COATING MATERIALS

Eckhard de Cleur, Duisburg; Rolf Dhein, Krefeld-Bockum; Hans Rudolph, Krefeld-Bockum, and Hans Joachim Kreuder, Krefeld-Bockum, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed May 28, 1974, Ser. No. 473,340

Claims priority, application Germany, June 1, 1973, 2328012

Int. Cl.² C08G *45/14*

U.S. Cl. 260—835 9 Claims

1. In a powder lacquer binder consisting of a mixture of

A. at least one polyepoxide having an average of at least two epoxide groups per molecule or a mixture thereof with a polyoxazoline and

B. at least one polyester resin which contains free carboxyl groups and has an acid number of 30 to 85 and a softening point above 40°C., the improvement wherein each said polyester resin is the condensation product of an acid anhydride consisting essentially of at least one non-aromatic dicarboxylic acid anhydride wherein at least 50 mol % of said dicarboxylic acid anhydride is succinic acid anhydride and at least one polyester resin having an OH number of about 40 to 100, said latter polyester resin being the condensation product of at least one polyalcohol and at least one aromatic dicarboxylic acid or said condensation product having up to 30 mol % of said aromatic dicarboxylic acid replaced with at least one cycloaliphatic dicarboxylic acid, at least one aliphatic dicarboxylic acid or a mixture thereof, said (A) being present in an amount to provide at least one epoxide group for each free carboxyl group of (B) or being present in an amount to provide a combined number of epoxide groups and oxazoline groups at least equal to the total number of free carboxyl groups of (B).

3,966,837

COMPOSITIONS CONTAINING EPOXY RESIN, CHAIN EXTENDER, FUNCTIONALLY TERMINATED ELASTOMER AND CURING AGENT

Changkiu K. Riew, Akron; Alan R. Siebert, Maple Heights, and Eugene H. Rowe, Akron, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 20, 1971, Ser. No. 210,156

Int. Cl.² C08G *45/04*

U.S. Cl. 260—837 R 6 Claims

1. An epoxy resin composition yielding high strength, high modulus, high impact resistant, thermoset products, comprising a di-epoxy compound, a less than equivalent proportion of a diphenol chain lengthening material, a functionally terminated elastomer which is a material having no functional groups other than two terminal phenolic hydroxyl groups, in an amount not over about 7½% by weight of the di-epoxy compound, and a curing agent for the epoxy compound.

3,966,838

POLYAMIDE BASE POWDER COATING MATERIAL

Rainer Feldmann; Wolfgang Kriesten; Karl Adolf Müller, all of Marl; Hans Joachim Panoch, Hullern, and Heinz Scholten, Lippramsdorf, all of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Germany

Filed Apr. 24, 1973, Ser. No. 354,123

Claims priority, application Germany, May 5, 1972, 2222122

Int. Cl.² C08L *77/00*

U.S. Cl. 260—857 R 14 Claims

1. Polyamide base powder compositions consisting essentially of a plurality of finely divided particles, said powder compositions comprising polyamides having carbonamide

groups with an average of from 8 to 11 aliphatically linked carbon atoms per carbonamide group, about 0.2 to 5 percent of said carbonamide groups having n-alkoxymethyl groups attached to the nitrogen atoms of said carbonamide groups and about 0.01 to 2 percent by weight of acid catalysts reactive with said polyamides at the temperature of film forming, said polyamides selected from the group consisting of polylauryllactam, polyundecanamide, mixtures thereof and mixtures thereof with a second polyamide selected from the group consisting of polycaprolactam, polyhexamethylenadipamide, polydodecamethyleneadipamide, polyhexamethylensebacamide, polyhexamethyleneeagelaic acid amide, polycapryllactam, copolymers thereof and mixtures thereof.

3,966,839

HOMOGENEOUS BLENDS OF POLYAMIDES WITH VINYL AROMATIC RESINS

Willard M. Sims, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.

Filed Jan. 30, 1975, Ser. No. 545,268
Int. Cl.² C08L *77/06*
U.S. Cl. 260—857 UN 11 Claims

1. A composition comprising a homogeneous blend of:
a. a polyamide resin;
b. a vinyl aromatic resin; and
c. a copolymer comprising a vinyl aromatic monomer copolymerized with maleic anhydride, said copolymer present at a level within the range of about 0.1 to about 5% by weight based on resin content,

said polyamide resin or said vinyl aromatic resin present at a level of from about 55 to 99% by weight based on the total weight of said polyamide and vinyl aromatic resins present in the composition.

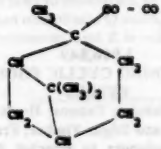
3,966,840

FREE RADICAL POLYMERIZATION OF OLEFINICALLY UNSATURATED MONOMERS, USING PINANYL-PEROXYESTERS

Wolfgang Edl, Grosshesselohe; Werner Meister, Munich, and Hans Seidl, Grunwald, all of Germany, assignors to Peroxid-Chemie GmbH, Hoellriegelskreut near Munich, Germany

Filed Jan. 27, 1975, Ser. No. 544,226
Claims priority, application Germany, Jan. 29, 1974, 2404209
Int. Cl.² C08L *67/02*, *67/06*; C07C *69/02*, *179/18*
U.S. Cl. 260—860 9 Claims

1. In a method of polymerizing an olefinically unsaturated monomer in the presence of a peroxyester capable of forming free radicals, the improvement which consists in said peroxyester being an ester of pinane hydroperoxide of the formula



wherein R is primary, secondary, or tertiary alkyl, cycloalkyl, aralkyl, aryl, haloaryl, alkylaryl, alkoxyaryl, alkoxyalkyl, or arylalkyloxyalkyl, the amount of said ester being sufficient to cause polymerization of said monomer.

3,966,841

MIXTURES OF POLYESTERS AND DAC-B RESIN

Robert L. Combs, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 30, 1975, Ser. No. 591,551
Int. Cl.² C08L *67/06*
U.S. Cl. 260—873 6 Claims

1. A composition comprised of a mixture of
A. a polyester of
1. a dicarboxylic acid component which is at least 80 mole percent terephthalic acid,
2. a diol component which is at least 80 mole percent ethylene glycol, and
B. from 1–14 weight percent, based on the weight of the polyester, DAC-B hydrocarbon resin.

3,966,842

THERMOPLASTIC MOLDING COMPOSITIONS OF RUBBER-REINFORCED STYRENE/MALEIC ANHYDRIDE RESINS AND POLYCARBONATE RESINS

Peter J. Ludwig, Huntington Beach, Calif., and Arnett L. Bird, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 18, 1974, Ser. No. 489,675
Int. Cl.² C08L *67/06*
U.S. Cl. 260—873 8 Claims

1. A thermoplastic molding composition comprising an intimate admixture of
a. a diene rubber-containing styrene/maleic anhydride composition, the rubber-containing styrene/maleic anhydride composition having copolymerized therein from 65 to 85 parts by weight of styrene and from 10 to 35 parts by weight of maleic anhydride and from 5 to 40 parts by weight of a rubber, the diene rubber being in the form of particles having diameters within the range of 0.02 to 30 microns dispersed throughout a continuous phase of styrene maleic anhydride resin, and
b. a polycarbonate resin in a proportion of from about 12 to 40 parts by weight of the polycarbonate resin to 88 to 60 parts by weight of the diene rubber-containing styrene/maleic anhydride resin.

3,966,843

NONFLAMMABLE POLYSTYRENE THERMOPLASTIC COMPOSITIONS CONTAINING A BROMINATED ESTER POLYMER

Arne O. Finberg, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 5, 1975, Ser. No. 574,212
Int. Cl.² C08L *25/14*
U.S. Cl. 260—874 12 Claims

1. A nonflammable thermoplastic polystyrene composition containing an amount sufficient to impart nonflammability characteristics to said composition of a brominated alkyl or aryl ester of a copolymer of maleic acid or anhydride and a compound containing ethylenic unsaturation.

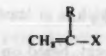
3,966,844

POLYMERIC MATERIAL HAVING IMPACT RESISTANT PROPERTIES AND PROCESS FOR THE PREPARATION THEREOF

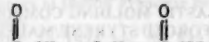
Sergio Arrighetti, Milan; Aldo Brancaccio, Cremona; Sebastiano Cesca, and Gianpaolo Giuliani, both of San Donato Milanese, all of Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Filed Oct. 31, 1974, Ser. No. 519,799
Claims priority, application Italy, Oct. 31, 1973, 30786/73
Int. Cl.² C08L *23/16*, *23/08*; C08F *255/06*, *255/02*
U.S. Cl. 260—878 R 4 Claims

1. A polymeric material having high impact resistance and resistance to ageing consisting of a rubbery terpolymer of ethylene, an alpha-olefin and a triene termonomer containing at least one pair of conjugate double bonds in the polymer chain and having grafted thereon a member of the group consisting of alkenyl aromatic monomers, vinyl and vinylidene halides and acrylic monomers having the general formula



in which R is hydrogen or an alkyl group having from 1 to 5 carbon atoms, and X is a member of the group consisting of



and

wherein R′ is an alkyl group having from 1 to 9 carbon atoms, and mixtures thereof.

3,966,845

ACRYLIC ACID GRAFTED POLYOLEFINS AS NUCLEATING AGENTS FOR UNGRAFTED POLYOLEFINS

Robert A. Van Brederode, and Robert A. Steinkamp, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 240,468, April 3, 1972, abandoned. This application May 22, 1974, Ser. No. 472,169

Int. Cl.² C08L *23/08*

U.S. Cl. 260—876 R **10 Claims**

1. In an injection molding operation to produce thick shaped articles the method of improving the crystallization properties of crystallite forming C_2 to C_8 polyolefins which comprises:

a. incorporating into said crystallite forming polyolefins from 0.1 to 15 weight percent of a nucleating agent consisting essentially of a grafted C_2 to C_8 polyolefin wherein said graft component comprises 0.1 to 15 weight percent of an acrylic acid.

b. melting said crystallite forming polyolefin, and

c. cooling the resulting blend to the temperature of crystallization of said blend and thus forming very small spherulites because of the presence of said nucleating agent.

3,966,846

PROCESS FOR THE PREPARATION OF TRANSPARENT HIGH IMPACT STRENGTH VINYL CHLORIDE POLYMERS

Walter Gutmann, Zurich, and Rene Nicolet, Fribourg, both of Switzerland, assignors to Lonza Ltd., Gampel, Valais, Switzerland

Filed Dec. 9, 1974, Ser. No. 530,554

Claims priority, application Switzerland, Dec. 7, 1973, 017183/73

Int. Cl.² C08L *27/06, 23/08, 31/02, 25/14*

U.S. Cl. 260—884 **21 Claims**

1. The process for the preparation of a transparent, high-impact-strength and weather-resistant vinyl chloride polymer by the polymerization of vinyl chloride either together with or without other copolymerizable monomers in aqueous dispersion by the emulsion polymerization method in the presence of at least one acrylic ester copolymers which comprises emulsion polymerizing, at a temperature of 50° to 70°C. and at an absolute pressure of 65 to 95 percent of the saturation pressure of said vinyl chloride or of said monomer mixture at said temperature, vinyl chloride or a monomer mixture containing at least 80 percent by weight of vinyl chloride in the presence of a dispersion of at least one acrylic ester copolymer consisting of 55 to 94.7 percent by weight of at least one acrylic ester containing 3 to 18 carbon atoms in the ester group, 35 to 5 percent by weight of α-methyl styrene and 0.3 to 10 percent by weight of a polyfunctional monomer having at least two non-conjugated ethylenic double bonds, at least one of said double bonds being of the allyl type, said acrylic ester copolymer having a mean particle diameter of 30 to 150 nm, determined by soap titration, and said acrylic ester copolymer being used in a quantity such that the resultant vinyl polymer contains 4 to 20 percent by weight of acrylic ester units.

3,966,847

CONTACT LENS FROM HYDROPHILIC GEL POLYMERS OF POLYVINYLPYRROLIDONE AND HYDROXYALKYL METHACRYLATE

Maurice Seiderman, 3306 Deronda Drive, Hollywood, Calif. 90028

Continuation of Ser. No. 218,598, Jan. 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 161,269, July 9, 1971, abandoned, which is a division of Ser. No. 92,280, Nov. 23, 1970, Pat. No. 3,721,657, which is a continuation-in-part of Ser. No. 845,499, July 28, 1969, Pat. No. 3,639,524. This application Jan. 4, 1974, Ser. No. 430,653

The portion of the term of this patent subsequent to Feb. 1, 1989, has been disclaimed.

Int. Cl.² C08L *31/02*

U.S. Cl. 260—885 **12 Claims**

1. A contact lens comprising a hydrophilic polymer consisting essentially of a polymerized mixture of polyvinylpyrrolidone and a hydroxyalkyl methacrylate in a weight ratio to the polyvinylpyrrolidone of from 60:40 to about 99:1, from 0.1 to about 25 parts by weight for each 100 parts of the polyvinylpyrrolidone of a crosslinking agent, and an amount of catalyst ranging from zero to about five grams thereof for each 100 grams of reaction mixture.

3,966,848

O,O,O′,O′-TETRAETHYL-S,S′-METHYLENE-BIS(p-PHENYLENETHIOMETHYLENE)

Michael Stanley Schrider, South Bound Brook, and Stephen David Levy, Trenton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 21, 1975, Ser. No. 570,294

Int. Cl.² C07C *9/06;* A01N *9/36*

U.S. Cl. 260—930 **1 Claim**

1. The compound phosphorodithioic acid, 0,0,0′,0′-tetraethyl S,S′-methylenebis (p-phenylenethiomethylene) ester.

3,966,849

BROMINE-CONTAINING CYCLIC PHOSPHONIC ACID ESTERS

Siegfried Noetzel, Kelkheim, Taunus; Horst Jastrow, Niederhochstadt, Taunus, and Edgar Fischer, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

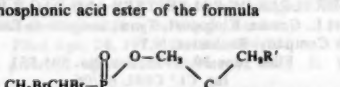
Filed Aug. 5, 1974, Ser. No. 494,877

Claims priority, application Germany, Aug. 7, 1973, 2339863

Int. Cl.² C07F *9/15;* C08K *5/53*

U.S. Cl. 260—937 **5 Claims**

1. A phosphonic acid ester of the formula



in which R′ and R″ represent a member selected from the group consisting of hydrogen, chlorine, bromine and R′ and R″ joined to form dibromo-cyclohexane.

3,966,850

O-ETHYL-S-N-PROPYL-O-(2-BROMO-4-CYANO-PHENYL)-THIONOTHIOL-PHOSPHORIC ACID ESTER

Hans-Jochem Riebel, Wuppertal, and Ingeborg Hammann, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

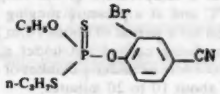
Filed Oct. 21, 1974, Ser. No. 516,838

Claims priority, application Germany, Nov. 6, 1973, 2355442

Int. Cl.² A01N 9/36; C07F 9/18

U.S. Cl. 260—940 1 Claim

1. O-Ethyl-S-n-propyl-O-(2-bromo-4-cyanophenyl)-thionothiolphosphoric acid ester of the formula



3,966,851

PHENOL PRECURSORS

Ronald George Feasey, Knebworth, and John Brewster Rose, Letchworth, both of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 165,769, July 15, 1971, Pat. No. 3,840,580. This application July 19, 1974, Ser. No. 490,101

Claims priority, application United Kingdom, July 15, 1970, 34308/70; July 15, 1970, 34309/70; Aug. 6, 1970, 37949/70; Dec. 23, 1970, 61171/70

Int. Cl.² C07F 9/14

U.S. Cl. 260—949 4 Claims

1. A phenol precursor having the formula $Q'ZQOPOCl_2$ in which Q is a bivalent aromatic radical selected from the group consisting of unsubstituted phenylene, biphenylylene and naphthylene radicals and substituted radicals derived therefrom and Q' is a univalent aromatic radical selected from the group consisting of unsubstituted phenyl, biphenylyl and naphthyl radicals and substituted radicals derived therefrom, the substituents in the Q and Q' radicals, when substituted, being selected from the group consisting of halogen atoms, alkyl and alkoxy radicals containing up to 10 carbon atoms, and radicals that tend to deactivate an aromatic ring, provided that not more than one of said Q and Q' radicals contains such deactivating substituents, and Z is $—SO_2—$ or —CO—.

3,966,852

METHOD FOR PREPARING TEST SPECIMENS FOR ANALYSIS

Karl-Heinz Neeb; Werner Schweighofer, and Hans-Jörg Weisse, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

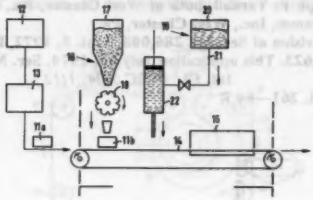
Filed Oct. 26, 1972, Ser. No. 300,963

Claims priority, application Germany, Oct. 28, 1971, 2153758

Int. Cl.² G21C 21/00

U.S. Cl. 264—.5 6 Claims

1. The process for preparing test specimens for X-ray analysis, which process comprises mixing together a radio active sample material to be analyzed, a molten phosphate which is normally solid at room temperature and melts at a temperature above 100°, said molten phosphate being at least 50 times by weight greater than the amount of said sample and a substance which serves as an internal standard for X-ray analysis,



and forming the resulting mixture into a shaped form suitable for X-ray analysis.

3,966,853

PROCESS FOR PREPARING PRILLED POROUS AMMONIUM NITRATE

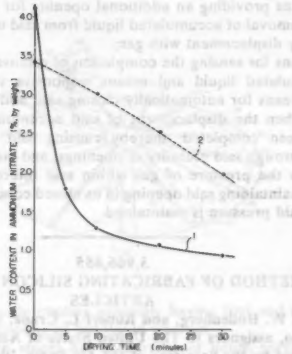
Naoto Osako; Katsumi Kozima; Hiroshi Shimizu, and Kazumi Kimura, all of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Sept. 25, 1974, Ser. No. 509,257

Claims priority, application Japan, Sept. 25, 1973, 48-107712

Int. Cl.² B01J 2/04

U.S. Cl. 264—13 8 Claims



1. In a process for preparing dried, prilled porous ammonium nitrate by prilling an aqueous solution of 93% to 98% by weight ammonium nitrate, whereby a prilled ammonium nitrate product is obtained containing 2% to 5% water, and thereafter drying said prilled ammonium nitrate, the improvement comprising:

a. drying said prilled ammonium nitrate containing 2% to 5% water under conditions such that the drying temperature is eventually lowered to a temperature less than the III—IV crystalline transition temperature of ammonium nitrate at least once when the water content of the prilled ammonium nitrate reaches the level of 0.3 to 1.5% by weight;

b. heating said dried ammonium nitrate further at a temperature higher than the III—IV transition temperature to complete drying of said ammonium nitrate; and

c. adding an anti-caking agent to said dried ammonium nitrate, whereby a dry, porous, prilled ammonium nitrate product is obtained.

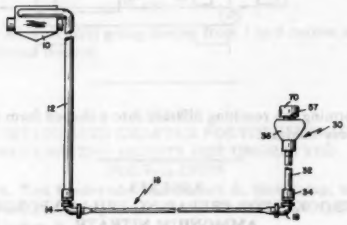
3,966,854
AIR TRAP

Harold J. Schramm, deceased, late of West Chester, Pa. (by Florence J. Schramm, executrix); John R. McCullough, and Joseph P. Yarnall, both of West Chester, Pa., assignors to Schramm, Inc., West Chester, Pa.

Division of Ser. No. 286,008, Sept. 5, 1972, Pat. No. 3,848,623. This application July 19, 1974, Ser. No. 490,211

Int. Cl.² C02C *5/04, 1/12*

U.S. Cl. 261—64 R **5 Claims**



1. A system for producing gas bubbles in a body of liquid comprising:

means for supplying a gas under pressure;

a submersible elongated conductor having an internal passage connected to receive gas from said supplying means, and a plurality of openings along its length for allowing said gas to flow outwardly from said internal passage to produce bubbles in a body of liquid;

means providing an additional opening for effecting rapid removal of accumulated liquid from said internal passage by displacement with gas;

means for sensing the completion of removal of said accumulated liquid and means responsive to said sensing means for automatically closing said additional opening when the displacement of said accumulated liquid has been completed, thereby causing said gas to escape through said plurality of openings; and means responsive to the pressure of gas within said internal passage for maintaining said opening in its closed condition so long as said pressure is maintained.

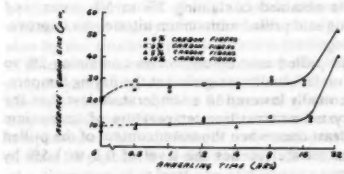
3,966,855
METHOD OF FABRICATING SILICON CARBIDE ARTICLES

Glenn W. Hollenberg, and Robert L. Crane, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 22, 1974, Ser. No. 445,046

Int. Cl.² C04B *35/52*

U.S. Cl. 264—65 **11 Claims**



10. A method of fabricating an article of silicon carbide which comprises the following steps:

a. blending α silicon carbide powder with about 0.75 to 20 weight percent of finely divided carbon particles, based upon the weight of the silicon carbide, so as to form a homogeneous mixture consisting essentially of the aforementioned ingredients;

b. milling the homogeneous mixture of step (a) in a liquid mixing medium which is inert to the ingredients of the mixture until the ingredients are completely dispersed;

c. drying the mixture of step (b) so as to evaporate the mixing medium;

d. initially compressing the dried mixture of step (c) in a compression zone formed of graphite and lined with a sheet of graphite at a temperature in the range of about 700° to 1200°C and at a pressure ranging from about 400 to 600 psi, the compressing being carried out under a vacuum of about 10^{-5} to 10^{-3} torr or under a blanket of an inert gas for a period of about 15 minutes to 1 hour;

e. compressing the resulting compacted article in the compression zone at a temperature in the range of about 1950° to 2250°C and at a pressure ranging from about 4000 to 6000 psi for a period of about 10 to 20 minutes, the compressing being carried out under a vacuum of about 10^{-5} to 10^{-3} torr or under a blanket of an inert gas for a period of about 10 to 20 minutes;

f. allowing the compression zone to cool to room temperature over a period of about 1 to 4 hours; and

g. recovering the silicon carbide article from the compression zone.

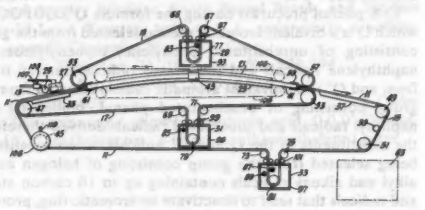
3,966,856
METHOD FOR THE PRODUCTION OF PEARLESCENT BUTTON BLANKS

Charles H. Williams, Export, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 431,225, Jan. 7, 1974, abandoned, which is a division of Ser. No. 248,702, April 28, 1972, Pat. No. 3,801,253. This application June 20, 1975, Ser. No. 588,671

Int. Cl.³ B29D *19/02;* **B29C** *5/10*

U.S. Cl. 264—71 **10 Claims**



1. A method for making pearlescent button blanks comprising:

a. contacting the undersurface of a first flat member having plural perforations therein in the shape of button blanks with an unperforated second flat member to form plural mold cavities in the shape of button blanks,

b. filling the cavities with a polymerizable resin containing light reflecting platelets,

c. contacting the upper surface of the resin in the cavities and the first flat member with an unperforated third flat member,

d. causing linear movement of the three flat members in the same direction but with one of the solid flat members moving at a speed different from the perforated first flat member so as to scuff the surface of the polymerizable resin in contact with the solid flat member that is moving at a different speed thereby causing the light reflecting platelets to orientate parallel to the resin surface being scuffed,

e. moving the three flat members through a polymerization zone during the scuffing to polymerize the resin while the light reflecting platelets are oriented,

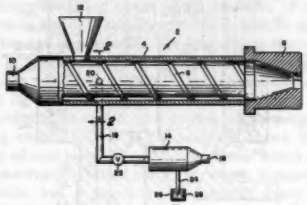
f. separating the solid flat members from the perforated flat member and ejecting the pearlescent button blanks from the perforated flat member.

3,966,857

LUBRICATION OF EXTRUDED MATERIALS

Ralph W. Charlton, Newfoundland, and Seevaram N. Varadhachary, North Plainfield, both of N.J., assignors to Congoleum Industries, Inc., Kearny, N.J.

Filed Dec. 31, 1969, Ser. No. 889,527
Int. Cl.² B29C 21/00
U.S. Cl. 264—75 2 Claims



1. A method of producing an extruded resinous product having a mosaic-like appearance wherein the surface of the product is characterized by a plurality of random distinct lines of demarcation dividing the surface of the product into a plurality of distinct adjacent areas comprising:

a. providing a blend of thermoplastic resinous chips selected from the group consisting of polyvinyl chloride, polyurethane, polyethylene, polypropylene, polyvinyl copolymers and mixtures thereof,

b. feeding said blend of thermoplastic resinous chips to the barrel of an extruder at the hopper end of the extruder,

c. softening and moving said blend of thermoplastic resinous chips in the barrel of the extruder without melting said chips,

d. applying a liquid lubricative coating agent selected from the group consisting of lubricating oils, paraffinic hydrocarbons, mineral oils, and oil fractions of petroleum to said softened blend of thermoplastic resinous chips by injecting said lubricative coating agent into the barrel of the extruder downstream from the hopper end thereof, and feeding said blend and said agent in said barrel towards the extrusion end of said extruder while mixing the same, and

e. extruding said softened blend of thermoplastic resinous chips into a desired product wherein substantially all of said thermoplastic resinous chips retain their individuality in said product,

f. thereby producing an extruded product having a mosaic-like appearance in which said thermoplastic chips are visually distinct one from another.

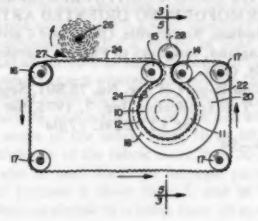
3,966,858

LINEAR APPARATUS AND METHOD FOR HIGH SPEED PRODUCTION OF AIR-LAID NON-WOVEN WEBS

Marion Frank Troy, Hinsdale, and Ewald Albert Kamp, Chicago, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 25, 1974, Ser. No. 436,615
Int. Cl.² B29J 5/00; D04H 1/58, 1/60
U.S. Cl. 264—91 16 Claims

1. The method of making a non-woven fibrous web which comprises: providing a fluid stream, incorporating fibers into said stream, continuously rotating the fiber containing fluid stream to direct said stream in a centrifugal flow and directing said stream by arcuate channels of a rotor and causing said fibers to exit from said channels in a direction opposite to the direction of movement of the periphery of said rotor, whereby the velocity of said fibers is greatly reduced, collecting said fibers from said centrifugally flowing stream in a substantially endless web of uniform thickness contained in an arc around the axis of rotation of said centrifugal flow, continuously



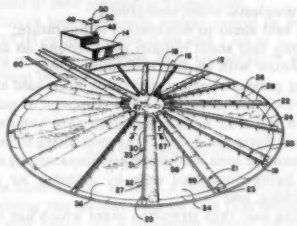
moving said web substantially in a circuit around said rotor, sealing across spaced portions of said web to assist in maintaining pressure in a region bounded by said web as it moves around said rotor by contacting said portions by means positioned therebetween and recovering said web after it leaves said region.

3,966,859

MULTIPLE STAGE LIQUID COOLING ASSEMBLY

Leonard J. Boler, Minneapolis, Minn., assignor to Cherne Industrial, Inc., Edina, Minn.

Filed Nov. 21, 1973, Ser. No. 417,793
Int. Cl.² B01F 3/04
U.S. Cl. 261—92 19 Claims



1. A large scale cooling assembly having first and second stages for air cooling of hot liquid wherein

each of such stages has a plurality of liquid spray units adapted for selective controlled projection of liquid drops under variable ambient wind conditions in at least one trajectory, the trajectory substantially extending generally perpendicular from its unit and in a common horizontal direction therefrom with drop sizes, velocities and volume rates of liquid spraying adapted to provide a directional wind effect across the unit along the common horizontal direction;

the first stage is aligned and oriented to receive and initially cool the hot liquid by the controlled projection of liquid drops into a reservoir portion adjacent the units of the first stage, creating a generally horizontal directional wind effect across the units of the first stage;

the second stage has at least some units adjacent units of the first stage and is aligned and oriented to receive and cool the liquid by the controlled projection of liquid drops into a reservoir portion adjacent the units of the second stage, creating a generally horizontal directional wind effect across the units of the second stage complementary to the directional wind effect across the adjacent units of the first stage; and

the second stage is aligned and oriented to receive and further cool the liquid initially cooled by the first stage.

3,966,860

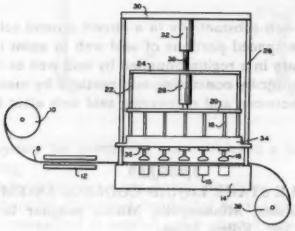
PROCESS FOR USING A CONTOURED ASSIST PLUG FOR THERMOFORMING ORIENTED ARTICLES

Jimmie E. Hudson, Bartlesville, Okla., and Calvin D. Dockery, Bacton, England, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 75,801, Sept. 24, 1969, abandoned. This application Jan. 7, 1975, Ser. No. 539,041

Int. Cl.² B29C *17/04*

U.S. Cl. 264—94 **7 Claims**



1. A process for forming high strength, open end articles from thermoplastic sheet comprising:

heating said sheet to orientation temperature;

contacting said sheet initially only around an annular area concentric with an article-forming zone;

applying pressure against said sheet along said annular area to stretch said sheet and cause slippage of polymer from within the area encompassed by said annular area said contact during said stretching continuing to be only along said annular area, said sheet encompassed by said annular area being contacted only by ambient air during said stretching; and

expanding said thus stretched sheet which has not yet contacted side walls of said forming zone by differential fluid pressure into conformity with said forming zone.

3,966,861

COMPOSITE TUBULAR FILM PROCESS AND APPARATUS

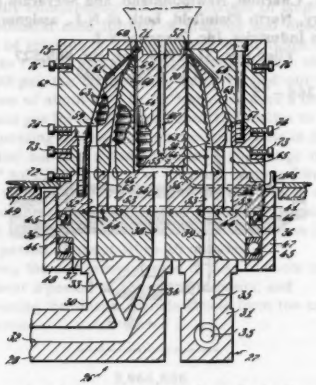
Edward G. Papesh, Palmer, and Edward F. Papesh, Wilbraham, both of Mass., assignors to Pierson Industries, Inc., Palmer, Mass.

Continuation-in-part of Ser. Nos. 730,505, May 20, 1968, abandoned, and Ser. No. 820,946, May 1, 1969, Pat. No. 3,649,143, which is a continuation-in-part of Ser. No. 73,505, May 20, 1968, abandoned. This application Aug. 9, 1971, Ser. No. 170,257

Int. Cl.² B29F *3/10*

U.S. Cl. 264—95 **4 Claims**

1. In the die forming of multi-layered film wherein separate streams of molten thermoplastic material from the die holder are formed into a plurality of layers in separate concentric chambers of the die head to be laminated therein into a composite film, the steps of: bottom feeding the separate streams of material from the die holder to the die head to form said separate layers; merging said separate layers together at a common orifice within said die head, and extruding said merged layers from said die head while continuously rotating the die head relative to the die holder to thereby achieve uniform gauge blown film free of pin holes, die scratches, weld



marks and the like imperfections, and to achieve also uniform flowing and uniting of the layers of thermoplastic material.

3,966,862

METHOD OF RECONSTITUTING MICA

Franklin C. Farnam, 19 Glenview Road, Asheville, N.C. 28804

Filed Sept. 27, 1974, Ser. No. 509,910

Int. Cl. C04b *35/16*

U.S. Cl. 264—110 **7 Claims**

1. In a method of making reconstituted mica sheet including the steps of blending mica and polyester, forming the mixture into a layer, and subjecting the layer to heat and pressure for bonding the layer into sheet form, the improvement comprising providing dry ground mica having a particle size in the range of from about 200 mesh to about 14 mesh; providing ground thermoplastic polyester having a particle size of less than about 60 mesh; proportioning the mixture to have from about 90 to about 50% mica by weight of the mixture; forming the layer to have a thickness in the range of from about ⅛ inch to about ¾ inch; bonding the layer into a sheet having a thickness in the range of from about 1/64 inch to about 3/34 inch; and maintaining the ground mica and ground polyester free from water during the steps of blending while producing the mixture, forming the layer and subjecting the layer to heat and pressure.

3,966,863

ORAL HYGIENE COMPOSITIONS

Geoffrey Charles Forward, Redhill; Susan Ann Duke, Croydon, and Melissa Anne Bell, New Malden, all of England, assignors to Beecham Group Limited, United Kingdom

Filed Dec. 4, 1974, Ser. No. 529,567

Int. Cl.² A61K *7/18*

U.S. Cl. 424—52 **8 Claims**

1. An oral hygiene composition comprising: (*a*) a calcium carbonate abrasive: (*b*) an ionic fluoride: and (*c*) an ionic monofluorophosphate, the weights of the said ingredients (*b*) and (*c*) being sufficient to provide respectively from 40–80% and 20–60% of the total fluorine content of the compositions.

3,966,864

FILAMENT-WOUND REINFORCED PLASTIC ARTICLES AND PROCESS OF MAKING AND USING SAME

Horst Stenzenberger, Dossenheim, Germany, assignor to Technochemie GmbH Verfahrenstechnik of Heidelberg, Heidelberg, Germany

Continuation of Ser. No. 334,472, Feb. 21, 1973, abandoned. This application Apr. 8, 1975, Ser. No. 566,530

Int. Cl.[2] B29C *27/26*

U.S. Cl. 264—137 7 Claims

1. In a process of producing a filament-wound reinforced substantially pore-free plastic article by wetting and impregnating fibrous material with a plastic material and winding the wetted and impregnated fibrous material around a mandrel of a shape corresponding to the inner structure of the desired plastic article, the improvement which consists in the steps of

a. wetting and impregnating the filamentary fibrous material with a liquid molten polymerizable bisimide having a melting point below 200°C., which melting point is at least 20°C. below the temperature at which substantial polymerization sets in, said wetting and impregnating step being carried out at a temperature above the melting point of said bisimide and below that at which substantial polymerization takes place, at which temperature said bisimide has a viscosity substantially lower than 800 centistokes;

b. winding the thus wetted and impregnated filamentary fibrous material around a winding mandrel of the desired shape to produce the respective wound article; and

c. heating said wound article at a temperature sufficient to effect addition polymerization and to cause hardening and curing to the filament-wound, reinforced plastic article.

3,966,865

METHOD FOR PRODUCING FIBRIL FIBROUS STRUCTURES

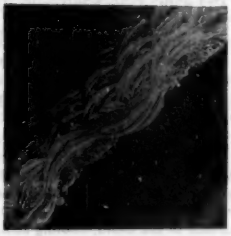
Takeshi Nishida, Kobe; Isao Shiromaru, Nagahama, and Tsutomu Teshima, Osaka, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Apr. 22, 1974, Ser. No. 462,950

Claims priority, application Japan, Apr. 21, 1973, 48-45628

Int. Cl.[2] B29H *7/18*

U.S. Cl. 264—147 13 Claims



1. A method for producing fibrillated fibrous structures which comprises forming into a knit fabric, or a woven fabric, or a non-woven fabric, fabrillatable composite filaments consisting essentially of (A) a polyamide and (B) a component having poor affinity to said polyamide and selected from the group consisting of a polyester, a polyolefin and polyacrylonitrile, each of said composite filaments in transverse cross-section consisting of at least three integral polyamide layers of substantially uniform thickness which comprise from 10 to 35 percent of the cross-sectional area of the filament and which diverge substantially radially in the outward direction and extend to the perimeter of the filament, said layers dividing said component B of said filament into at least three separate segments which extend to the perimeter of the filament; immersing said fabric in an aqueous emulsion consisting essentially of water, from 1.5 to 50 percent by weight of an alcohol selected from the group consisting of benzyl alcohol and phenylethyl alcohol, and a surfactant in an amount in the range of 5 to 20 percent by weight, based on the weight of said alcohol, and effective to impart to said emulsion a percent transmittancy of less than 20 percent; and maintaining said fabric in contact with said emulsion under conditions effective to swell and shrink component A and to minimize swelling and shrinking of component B for a period of time effective to separate at least about 70% of said segments of component B from said polyamide layers whereby to fibrillate the composite filaments to impart a soft silky feel and a bulky appearance to the fibrous structure, and in the case of knit and woven fabrics to shrink the arena of the fabric from 10 to 60 percent, to increase the thickness of the fabric more than 20 percent and wherein the ratio of said thickness increase percent to said area shrinkage percent is more than 2, and in the case of non-woven fabrics to shrink its volume from 10 to 40 percent.

3,966,866

POLYURETHANE FIBER UNIFORMITY

Richard L. Ballman, Gulf Breeze; Kenneth R. Lea, Pensacola; Walter J. Nunning, and John H. Southern, both of Gulf Breeze, all of Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 400,770, Sept. 26, 1973, abandoned. This application July 15, 1974, Ser. No. 488,635

Int. Cl.[2] B29F *3/10*

U.S. Cl. 264—171 6 Claims

1. A process for preparing a conjugate fiber, comprising:

a. preparing a solid melt-spinnable fiber-forming polyurethane by reacting together

1. a polymeric glycol having a molecular weight between 800 and 3000,

2. between 4.6 and 8.8 mols of an aromatic diisocyanate per mol of said polymeric glycol, and

3. sufficient low molecular weight polyol to provide an NCO/OH ratio between 0.96 and 1.04 to 1;

b. heating said polyurethane to a temperature within the range from at least

$$210.6 + 3\,\frac{\text{mols diisocyanate}}{\text{mols polymeric glycol}}\ ^{\circ}\text{C.}$$

and less than 255°C. to form a first molten stream;

c. maintaining the temperature of said first molten stream within said range for a treatment period of at least 10 seconds and less than a treatment period which would cause objectionable degradation;

d. combining said first molten stream with a second molten stream in a side-by-side conjugate relationship to form a conjugated stream, said second molten stream being formed from a melted fiber-forming hard polymer;

e. extruding said conjugated stream through a spinneret orifice; and

f. cooling said conjugated stream to form a conjugate yarn.

3,966,867

MANUFACTURE OF UNIQUE POLYETHYLENE TEREPHTHALATE FIBER

Johannes Pieter Munting, Emmen, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 187,521, Oct. 7, 1971, Pat. No. 3,838,561, which is a division of Ser. No. 852,915, Aug. 25, 1969, Pat. No. 3,650,879. This application Mar. 13, 1974, Ser. No. 450,776

Claims priority, application Netherlands, Aug. 31, 1968, 6812442

Int. Cl.[2] B29C *17/02*; D01D *5/10*, *5/16*

U.S. Cl. 264—210 F 3 Claims

1. A process for producing a reinforcing fiber of polyethylene terephthalate which comprises drawing a non-drawn fiber of polyethylene terephthalate in two stages, the polyethylene

terephthalate having a relative viscosity of from 1.50 to 1.70, the drawing in the first stage being effected at a temperature in the range of about 70°C. to about 100°C. at a draw ratio of from about 3.8 to 4.2, and the drawing in the second stage being effected in the presence of superheated steam at a temperature of from about 210°C. to 250°C. and at a draw ratio such that the total draw ratio in the two stages is in the range of from about 5.6 to 6.0; said fiber of polyethylene terephthalate having a tenacity of at least about 7.5 grams per denier, an elongation at break of at least about 9%, an elongation of not more than about 5% under a load of 5 grams per denier and a shrinkage of less than 4% when kept under a tension of 0.05 grams per denier for 4 minutes at about 160°C.

3,966,868

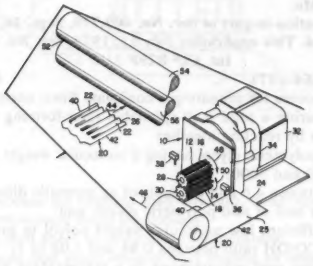
STRIP STRAIGHTENING APPARATUS, PRODUCT AND METHOD

Henry F. Hope, 3192 Huntingdon Road, Huntingdon Valley, Pa. 19006, and Stephen F. Hope, 2548 Wyandotte Road, Willow Grove, Pa. 19090

Filed Dec. 9, 1974, Ser. No. 530,685

Int. Cl.² B29C *15/00*

U.S. Cl. 264—238 **29 Claims**



1. A method of feeding, without attaching a leader, a strip of photographic material which has a tendency to curl, between successive roll pairs in roll type photographic processing equipment and avoiding curling of said material about said rolls, which comprises

feeding the strip between a pair of corrugating means and corrugating an end portion of the strip forming longitudinal corrugations in said end,

moving said corrugating means apart and out of engagement with said strip,

directly feeding said end portion between at least one following roll pair while continuing to pass a portion of said strip between said corrugating rolls but out of engagement therewith.

3,966,869

FORMING A REMOVABLE CLOSURE MEMBER IN SITU

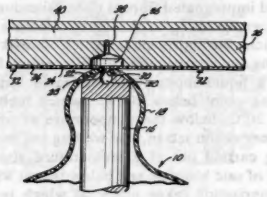
Gerald C. Kohl, 1106 S. Fourth St., Tacoma, Wash. 98405

Filed Apr. 14, 1972, Ser. No. 244,018

Int. Cl.² B32B *31/04*; B29C *6/04*; A61J *9/00*

U.S. Cl. 264—242 **4 Claims**

1. In the process of forming a removable closure member for the end opening in a bulbous, open-ended nipple or the like of resiliently flexible sheet material, the steps of interposing the nipple in the space between spaced mutually opposing surfaces of a pair of mold sections having mutually opposing recesses therein, one of which mold sections takes the form of an elongated mandrel which is inserted in the nipple and has a recess in the inserted end thereof, registering the end opening in the nipple with the recesses and while maintaining a seal about the opening between the inserted end of the mandrel and the surface of the other mold section, injecting a settable liquid molding composition into the cavity formed by the recesses and the opening in the nipple, to form the removable closure member, and relatively retracting the mandrel and the other mold section from the nipple and the closure member after the molding composition of the closure member has set in the cavity, said recesses having crosswise dimensions relatively parallel to the plane of the opening, which are adapted so that relatively enlarged inside and outside heads are formed



on the closure member at the respective sides of the opening, the inside head formed in the recess of the mandrel, having a peripheral contour in directions extending relatively away from the opening, whereby the inside head is adapted to pass through the opening when a force is applied to the closure member in the direction of the outside head, relatively crosswise of the nipple and generally axially of the opening.

3,966,870

HOLLOW, MULTI-LAYERED, CROSS-LINKED PLASTIC STRUCTURES AND PROCESS FOR PRODUCING SAME

Camillo M. Vecchiotti, Ridgewood, N.J., assignor to Amerace Corporation, New York, N.Y.

Division of Ser. No. 410,815, Oct. 29, 1973, Pat. No. 3,900,640. This application Feb. 7, 1975, Ser. No. 548,088

Int. Cl.² B29C *5/04*; B29D *9/00*, *23/08*

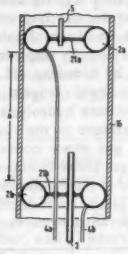
U.S. Cl. 264—255 **6 Claims**

1. A process for producing a hollow, multi-layered cross-linked, plastic structure from a linear thermoplastic polyester and a cross-linkable polyethylene having a melting point lower than the melting point of the polyester, said process comprising the steps of: charging a mold with a sufficient amount of the thermoplastic polyester material to form a substantially uniform layer on the inner surface of said mold; heating said mold to a temperature above the melting point of the polyester; rotating said mold so as to fuse the polyester contained within the mold and to uniformly distribute the fused polyester on the inner surface of the mold; cooling said mold to a temperature below the melting point of the polyester but above that of the cross-linkable polyethylene thus crystallizing the polyester to a solid layer; stopping the rotation of the mold; charging said mold with a sufficient amount of the cross-linkable polyethylene to form a substantially uniform layer on said polyester layer; heating said mold to a temperature above the melting point of the polyethylene and sufficiently below the melting point of the polyester so as not to cause dimensional distortion of the polyester; rotating the polyethylene charged mold for a sufficient period of time to fuse said polyethylene, uniformly distribute the polyethylene on the inner surface of the polyester layer and effect cross-linking of said polyethylene so as to set the polyethylene layer and effect cross-linking of said polyethylene to said linear polyester; and stopping the rotation of said mold to remove the resulting hollow, cross-linked multi-layered polymeric structure.

3,966,871
METHOD AND APPARATUS FOR INSPECTING TUBULAR CAVITIES

Peter Schröder, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim, Germany

Filed Nov. 19, 1974, Ser. No. 525,229
Claims priority, application Germany, Nov. 26, 1973, 2358802
Int. Cl.² B29C 7/00
U.S. Cl. 264—318 **4 Claims**



1. A method for obtaining an image of the surface of an internal zone of a cavity having an open end, said method comprising transporting a flowable elastically hardenable casting plastic through said end to said zone and casting said plastic against said surface and hardening of said plastic to an elastic casting, pulling said casting from said zone and through said open end with said casting elastically retaining an image of said surface, dams for said cavity being first inserted through said end and initially moved to said zone, and with the dams flexibly interconnected against separation more than the extent of said zone, and said plastic being transported under pressure to said zone through a tube inserted through said end and the one of said dams most adjacent to said end, with said tube opening between said dams and said plastic being injected between said dams to separate the same so they embrace said zone, said dams being interconnected so as to hold the dams against said separation while said plastic is injected therebetween, and when pulling said casting from said zone, said casting elastically stretching and releasing itself from any depressions on the inside of said tube, said dams, while interconnected, permitting said stretching.

3,966,872
COUPLED CATIONIC AND ANIONIC METHOD OF SEPARATING URANIUM

Parameshwaran Sundar; Leonard Elikan, and Ward L. Lyon, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 1, 1973, Ser. No. 411,889
Int. Cl.² B01D 11/00
U.S. Cl. 423—9 **38 Claims**

1. A method of separating uranium from contaminating ions in an aqueous feed liquor containing uranyl ion comprising:
1. extracting said feed liquor with a first, non-interfering, water-immiscible, organic solvent containing a reagent which reacts with said uranyl ion to form a complex soluble in said solvent; 2. either
A. stripping said organic solvent with a stripping liquor of an aqueous carbonate solution having a pH of about 8 to about 9 and a molarity of about 0.25 to about 0.75 or
B. (1) stripping said organic solvent with a stripping liquor of an aqueous sulfuric acid liquor having a pH of about 0.5 to about 5 containing a reducing ion, 2. oxidizing uranous ion in said sulfuric acid liquor to uranyl ion, and 3. adjusting the pH of said sulfuric acid liquor to about 0.9 to about 1.5;
3. extracting said stripping liquor with an amine liquor comprising a second, non-interfering, water-immiscible, organic solvent, about 0.1 to about 0.5 M of an amine having the formula

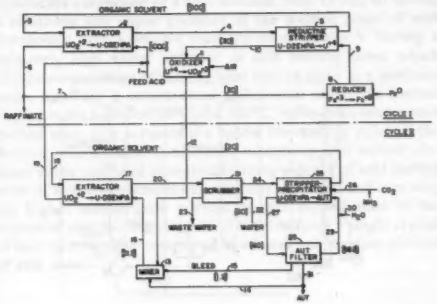
$$N[R]_n$$

where n is 3 to 4 and each R is independently selected from alkyl from C_7 to C_{12}, and about 1 to about 10% by volume of a solubilizer;
4. stripping said amine with an ammonium carbonate solution containing sufficient ammonium and carbonate ions to precipitate a uranium complex; and
5. collecting said precipitated uranium complex.

3,966,873
URANIUM COMPLEX RECYCLING METHOD OF PURIFYING URANIUM LIQUORS

Leonard Elikan, Pittsburgh; Ward L. Lyon, Monroeville, and Parameshwaran S. Sundar, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 1, 1973, Ser. No. 411,886
Int. Cl.² C01G 43/00, 43/02
U.S. Cl. 423—10 **23 Claims**



1. A method of separating uranium from an aqueous liquor containing uranyl ion and contaminating cations comprising:
1. mixing said aqueous liquor with recycled uranium complex to form a solution of said uranium complex in said aqueous liquor;
2. extracting said aqueous liquor with a non-interfering, water immiscible organic solvent containing a reagent which reacts with said uranyl ions forming a complex soluble in said solvent;
3. stripping said organic solvent with an aqueous solution containing at least enough ammonium and carbonate ions to precipitate a uranium complex; and
4. recycling a portion of said precipitated uranium complex to step (1).

3,966,874
EXTRACTION OF ALUMINA FROM BAUXITE ORES

Richard H. Featherston, Richmond, Va.; Joseph P. Fischer, Ingleside, Tex.; Meriwether L. Garing, Portland, Tex., and James R. Wright, Corpus Christi, Tex., assignors to Reynolds Metals Company, Richmond, Va.

Filed May 14, 1975, Ser. No. 577,411
Int. Cl.² C01F 7/06
U.S. Cl. 423—121 **8 Claims**

1. An improved wet caustic process for the extraction of caustic soluble alumina values from a bauxite containing, on a dry basis, at least 1% by weight of goethite, calculated as (FeO)OH, and at least 1% by weight of a monohydrated alumina, calculated as $AL_2O_3.H_2O$, which process comprises the steps of: (a) forming a caustic slurry of said bauxite; (b) in a preheating zone preheating said caustic slurry of bauxite

in the absence of a hereafter defined calcium compound and in the liquid phase to a temperature of at least 200°C; (c) passing the preheated slurry to a digestion zone wherein said slurry is maintained in the liquid phase under digesting conditions of at least 225°C for a digesting time sufficient to dissolve substantially all of the caustic soluble alumina from said bauxite, there being also added to said digestion zone a calcium compound selected from the group consisting of CaO, $Ca(OH)_2$ and $CaCo_3$; and (d) removing the resulting slurry from said digestion zone and in a recovery zone recovering the alumina values therefrom.

3,966,875

PROCESS FOR THE DESULFURIZATION OF GASES

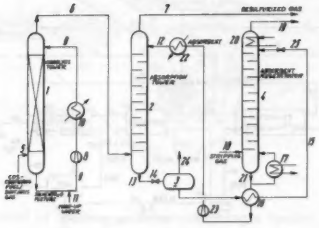
Karl Bratzler, Bad Homburg, and Alexander Doerges, Frankfurt am Main, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 11, 1973, Ser. No. 405,678

Claims priority, application Germany, Oct. 13, 1972, 2250169

Int. Cl.² B01D *53/34*

U.S. Cl. 423—220 1 Claim



1. A process for the desulfurization of a raw fuel or synthesis gas containing carbonyl sulfide and hydrogen sulfide which comprises the steps of:

a. treating the gas at a temperature of 50° to 105°C with a low volatility organic solvent miscible with water and selected from the group consisting of N-substituted pyrrolidone, N-substituted piperidones, and polyethylene glycol ethers said solvent containing 15 to 50 mole% water to selectively dissolve the carbonyl sulfide and yield a gas free from carbonyl sulfide said solvent being chemically inert with respect to reaction with carbonyl sulfide in the absence of water and wherein the rate at which said solvent is contacted with said gas is selected to maintain an absorption factor of at least 1 for carbonyl sulfide in terms of the anhydrous solvent constant rate;

b. hydrolyzing the carbonyl sulfide dissolved in the solvent with water combined therewith simultaneously with the treatment of step (*a*) to transform the solution of dissolved carbonyl sulfide to hydrogen sulfide and carbon dioxide and stripping the solvent laden with the hydrogen sulfide formed by the hydrolysis of the carbonyl sulfide with a further part of the raw gas simultaneously with step (*a*); and

c. subsequently scrubbing said carbonyl sulfide-free gas to remove therefrom hydrogen sulfide.

3,966,876

GAS PURIFICATION

Frank Henry Singleton, Croydon; Derek Vernon Gosden, and Graham Woodhouse, both of Horsham, all of England, assignors to Woodall-Duckham, Limited, England

Filed Dec. 18, 1973, Ser. No. 425,715

Int. Cl.² C01B *17/04*

U.S. Cl. 423—233 2 Claims

1. In a gas purification process in which H_2S in a foul gas stream is absorbed by a liquid reagent, said liquid reagent gradually becoming contaminated predominantly with at least one member selected from a group consisting of thiosulphate, sulphate and thiocyanate, the improvement in which comprises controlling the build up of said contaminants in the liquid reagent without directly disposing of the contaminated spent liquid reagent by bleeding off a side stream of said contaminated, spent liquid reagent, subjecting said side stream to high-temperature hydrolysis in a non-oxidizing atmosphere at a temperature in the range of 500° to 800°C, thereby producing a gas phase containing H_2S and a solid phase, recycling said gas phase containing H_2S to the foul gas stream being subjected to purification by the said process, and subjecting the solid phase to reduction by contact with a reducing gas at a temperature in the range of 500° by 800°C.

3,966,877

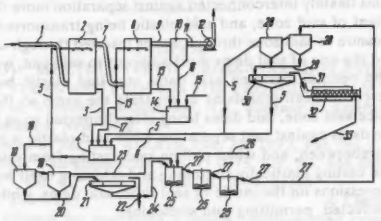
METHOD OF PROCESSING OF WASTE GASES

Vladimir Sergeevich Kalach, ulitsa Lobachevskogo, 22, kv. 37, and Lidia Ivanovna Burlakova, Leninsky prospekt, 52, kv. 316, both of Moscow, U.S.S.R.

Filed Sept. 11, 1974, Ser. No. 505,082

Int. Cl.² B01D *53/34*

U.S. Cl. 423—240 8 Claims



1. Method of processing of a waste gas containing hydrogen fluoride and silicon tetrafluoride which comprises absorbing said hydrogen fluoride and silicon tetrafluoride from said waste gas by an aqueous solution containing at least one ammonium compound selected from the group consisting of ammonium carbonate, ammonium bicarbonate and ammonium fluoride and also containing ammonia and sodium fluoride, thereby forming an aqueous solution containing ammonium fluoride and a precipitate of sodium fluosilicate, treating said solution with sodium carbonate to form a precipitate of sodium fluoride, and separating the thus formed sodium fluoride and other precipitates from the solution, and returning the remaining solution for further absorption.

3,966,878

METHOD FOR REMOVING POLLUTANTS FROM A GASEOUS MIXTURE

Josef Pausch, Minnetonka, and Sung Lim Kwon, St. Paul, both of Minn., assignors to General Resource Corporation, Hopkins, Minn.

Filed Nov. 8, 1973, Ser. No. 413,928

Int. Cl.² C01B *17/00*

U.S. Cl. 423—242 7 Claims

1. A method of treating a high temperature waste gaseous

product containing a chemically active substance consisting of SO_2, SO_3, or mixtures thereof, comprising the steps of:

a. passing said gaseous product at its elevated temperature through the interior of a substantially upright U-shaped channel;

b. dispersing as a mist into the interior of said channel in at least one limited area therein within the flow path of said gaseous product, an aqueous solution containing a material which reacts with the chemically active substance in said gaseous product producing a precipitate, and concomitantly evaporating the moisture of the mist by the elevated temperature of said gaseous product to form a separable relatively dry reaction product;

c. and controlling a condition relating to the dispersion of said solution within said channel in response to a measurement of a condition of at least one portion of the contents of said channel at a point between the opposite ends of said channel.

3,966,879

REMOVAL OF SULFUR OXIDES AND PARTICULATE MATTER FROM WASTE GAS STREAMS

Willem Groenendaal; Friedrich C. Taubert, both of The Hague; Jaap E. Naber, and Gijsbertus A. Bekker, both of Amsterdam, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 6, 1974, Ser. No. 467,530

Claims priority, application United Kingdom, May 8, 1973, 21848/73

Int. Cl.² B01J *8/00*; **C01B** *17/00*

U.S. Cl. 423—244 **10 Claims**

1. A process for removing sulfur oxides and particulate matter from waste gas streams containing sulfur oxides and particulate matter which comprises:

A. contacting the waste gas stream under oxidative conditions in a sulfur oxide and particulate matter removal zone with a solid acceptor comprising copper or a copper compound or mixtures thereof supported on a particulate carrier, said contact being established by passing the waste gas at a temperature of from about 300° to 500°C. cross-currently through a moving bed of the solid acceptor, thereby accepting the sulfur oxide on said acceptor and filtering out the particulate matter to afford an acceptor loaded with sulfur oxides and particulate matter and a waste gas stream substantially free of both sulfur oxides and particulate matter;

B. removing the particulate matter from the loaded acceptor in a first separation zone wherein the acceptor loaded with both sulfur oxides and particulate matter is stripped of particulate matter by transporting the loaded acceptor through a stream of an inert stripping gas;

C. separating the sulfur oxides from the acceptor product of the first separation zone by contacting the acceptor with a reducing gas at a temperature between 300°–500°C in a second separation zone whereby the sulfur oxides bound to the acceptor are released as SO_2 gas and

D. returning the acceptor product of the second separation zone into cross-current contact with said waste gases under oxidative conditions in the sulfur oxide and particulate matter removal zone.

3,966,880

METHOD FOR PRODUCING ALKALI METAL GOLD SULFITE

George Dietz, Jr., Watertown, Conn.; Robert M. Skomoroski, Paterson, N.J., and Robert G. Zobbi, Southbury, Conn., assignors to American Chemical & Refining Company Inc., Waterbury, Conn.

Filed June 17, 1975, Ser. No. 587,607

Int. Cl.² C01B *17/62*; **C01G** *7/00*

U.S. Cl. 423—265 **12 Claims**

1. In a process for making alkali metal gold sulfite, the steps comprising

a. admixing an aqueous solution of gold chloride with an excess of magnesium oxide to produce a precipitate of magnesium oxide particles having magnesium aurate thereon, the molar ratio of gold chloride to magnesium oxide being 1:2–6 and said solution being at a pH of at least 7.0;

b. admixing the magnesium aurate with an aqueous solution of alkali metal sulfite to produce alkali metal gold sulfite in solution and a precipitate of magnesium oxide, said solution having a pH of at least 10 and the molar ratio of magnesium aurate to alkali metal sulfite being 1:5–14; and

c. recovering the alkali metal gold sulfite.

3,966,881

METHOD OF MAKING A SINGLE CRYSTAL INTERMETALLIC COMPOUND SEMICONDUCTOR

Masaaki Ayabe, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 3, 1973, Ser. No. 356,949

Claims priority, application Japan, May 11, 1972, 47-46629

Int. Cl.² C01B *25/00*

U.S. Cl. 423—299 **5 Claims**

1. A method of making an intermetallic compound semiconductor composed of a first element from Group III having a relatively low vapor pressure at the melting point of said compound and a second element from Group V having a relatively high vapor pressure at said melting point which comprises the steps of melting said first element in a confined zone, applying a temperature differential along the melted first element between 20°C and 300°C, while maintaining said melted mass at a temperature below the melting point of the desired intermetallic compound, vaporizing said second element in the confined zone, maintaining a depth of said melted mass of said first element substantially constant, and exposing the higher temperature portion of said melted mass to the vapors of said second element to thereby form a single crystal of said intermetallic compound at a lower temperature portion of said zone.

3,966,882

THERMAL STABLE SYNTHETIC ZEOLITE

Philip Kenerick Maher, Baltimore, and Carl Vance McDaniel, Laurel, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 233,827, March 10, 1972, abandoned, which is a continuation of Ser. No. 29,285, April 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 714,357, March 19, 1968, Pat. No. 3,518,051, which is a continuation-in-part of Ser. No. 367,864, May 15, 1964, abandoned. This application Apr. 15, 1974, Ser. No. 461,050

The portion of the term of this patent subsequent to Dec. 20, 1983, has been disclaimed.

Int. Cl.² C01B *33/28*

U.S. Cl. 423—328 **2 Claims**

1. As a composition of matter a synthetic ultra stable zeolite aluminosilicate having the composition expressed in terms of oxide mole ratios as follows

$$X\ M_{2/n}O:\ Al_2O_3 :\ 2.5 - <3.5\ SiO_2 :\ Y\ H_2O$$

where M represents alkali metal of less than one percent by weight of said zeolite and hydrogen and n is the valence of M, X may vary from 0 to 1 and Y may be any value up to 9, said ultrastable zeolite aluminosilicate further being characterized by:

a cubic cell size of 24.45 to 24.70 angstroms

and an ultrastable structure as evidenced by retention of a surface area of (i) greater than 100 m^2/g after treatment at 1650°F. for 16 hours and (ii) greater than 200 m^2/g after treatment with an atmosphere of 25 percent steam at a temperature of greater than 1525°F. for 16 hours.

3,966,883

SYNTHETIC FERRIERITE SYNTHESIS

David Evan William Vaughan, Columbia, and Grant Campbell Edwards, Silver Spring, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Oct. 16, 1974, Ser. No. 515,380
Int. Cl.[2] C01B *33/28*
U.S. Cl. 423—329 4 Claims

1. A process for preparing synthetic ferrierite which comprises the steps of

a. preparing a reactant mixture having the following oxide molar ratios of reactants 0.75 to 1.5 Li_2O:0.9 to 1.2 Al_2O_3:7 to 20 SiO_2:50 to 600 H_2O,

b. adding powdered natural or synthetic ferrierite in a concentration of about 0.1 to 10% to the reaction miture,

c. heating the reactant mixture to about 180° to 325°C. in a closed reaction vessel at a pressure of 1 to 119 atmospheres,

d. washing, drying and recovering a ferrierite product having the X-ray diffraction pattern essentially as shown in Table C.

3,966,884

SYNTHESIS OF WOLLASTONITE FROM NATURAL MATERIALS WITHOUT FUSION

Claude J. Jacob, Olivet, France, assignor to Bureau de Recherches Geologiques et Minieres, Paris, France

Filed June 20, 1974, Ser. No. 481,427
Claims priority, application France, June 20, 1973, 73.22459
Int. Cl.[2] C01B *33/24*
U.S. Cl. 423—331 6 Claims

1. A process for producing low-temperature wollastonite wherein a natural chalk-containing material which comprises silica in the form of sponge spikelets and calcium carbonate in amounts within 10% of the stoichiometric ratio (a) is mixed with a mineralizing agent selected from the group consisting of NaCl, NaF, Na_2CO_3, Na_2SiO_3, Na_2WO_4, KCl, $CaCl_2$, CaF_2, LiF, LiCl and Li_2CO_3, (b) said mixture is reduced in granulometry to lower than 2 mm and rendered homogeneous, and (c) said mixture of (b) is heated to a temperature of between 1000° - 1100°C for 1 to 5 hours.

3,966,885

METHODS AND MATERIALS FOR JOINING SILICON POWDER STRUCTURES

Edwin Richard Wells May, Bournemouth, England, assignor to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 430,772, Jan. 4, 1974, abandoned, which is a continuation of Ser. No. 852,508, Aug. 22, 1969, abandoned. This application Mar. 3, 1975, Ser. No. 554,697
Claims priority, application United Kingdom, Aug. 29, 1968, 41202/68
Int. Cl.[2] C01B *21/06*
U.S. Cl. 423—344 6 Claims

1. A method of producing a unitary silicon nitride structure by joining together at least two shaped silicon based bodies, comprising the steps of:

a. providing separate shaped bodies of material selected from the group consisting of silicon powder and silicon powder which has been at least partially nitrided, said shaped bodies having faces at which they are to be joined together,

b. applying to at least one of the joining faces a thin film of a mixture of silicon powder and a heat removable liquid therefor, said binder being such that no undesirable residue results from heating the binder,

c. assembling together said shaped bodies with their joining faces in juxtaposition and in contact with the intervening mixture of silicon powder and binder, the joining faces being held together under light pressure,

d. maintaining said faces in juxtaposition, and

e. slowly heating said assembled shaped bodies in a nitriding atmosphere to remove said liquid binder, continuing said heating to avoid collapse of the intervening silicon powder into a molten pool, and to convert the material of said bodies and the intervening silicon powder into a unitary silicon nitride structure.

3,966,886

METHOD OF PREPARING AND ISOLATING METAL HYDROCARBONYLS AND RECOVERY OF PURE METALS THEREFROM

Lubertus Bakker, Mentor, Ohio, assignor to Joseph P. Meyers, Palos Verdes, Calif., a part interest

Filed Dec. 29, 1971, Ser. No. 213,725
Int. Cl.[2] C01G *1/04*
U.S. Cl. 423—417 3 Claims

1. A method comprising

1. contacting a solid material having a maximum particle dimension of 1 mm. and containing nickel present as any of free metal, metal oxides, metal sulfides, metal salts, metal esters and mixtures thereof with a mixture of hydrogen and oxygen in a molar ratio of from 3:1 to 1:3 at a temperature of 185° ±15°C. and a pressure of from one to about 250 atmospheres for a time sufficient to convert substantially all of said nickel in said solid material to nickel hydrocarbonyl, and

2. separating such nickel hydrocarbonyl from the reacting system while maintaining said system at said temperature and pressure.

3,966,887

PROCESS FOR PRODUCTION OF CARBON FIBERS AND THE RESULTANT FIBERS

Pierre Chiche, Verneuil-en-Halatte, France, assignor to Charbonnages de France, Paris, France

Filed Oct. 26, 1972, Ser. No. 301,150
Claims priority, application France, Nov. 8, 1971, 71.39939
The portion of the term of this patent subsequent to Jan. 8, 1991, has been disclaimed.
Int. Cl.[2] D01F *9/12*
U.S. Cl. 423—447 4 Claims

1. In a process for the production of carbon fibres from a strongly aromatic distillation residue pitch, comprising subjecting said pitch to a heat treatment at a temperature approximately 407°C, the product of the heat treatment being thereafter melt spun into fibres which are then oxidized and carbonized, the improvement comprising:

adding to said distillation residue pitch, no later than during the heat treatment, and agitating therewith, a polymer selected from the group consisting of a phenolformaldehyde polymer and a non-cross-linked polyester resin, in an amount approximately 10% by weight and sufficient to improve the mean breaking stress and the mean Young's modulus of the carbonized fibres.

3,966,888

ANHYDROUS MAGNESIUM CHLORIDE USING ETHYLENE GLYCOL AND AMMONIA

David G. Braithwaite, and Ronald J. Allain, both of Brookhaven, Miss., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Oct. 29, 1975, Ser. No. 626,813
Int. Cl.[2] C01F *5/34*
U.S. Cl. 423—498 4 Claims

1. A method of preparing anhydrous magnesium chloride from magnesium chloride hydrates which comprises the steps of:

A. dissolving a magnesium chloride hydrate in ethylene glycol to form an ethylene glycol magnesium chloride hydrate solution;

B. heating the ethylene glycol magnesium chloride hydrate solution to a temperature and for a period of time sufficient to remove all the water therefrom to produce an ethylene glycol anhydrous magnesium chloride solution;
C. treating the ethylene glycol anhydrous magnesium chloride solution with ammonia to form a magnesium chloride ammonia complex which is insoluble in the ethylene glycol, with the temperature of the ethylene glycol magnesium chloride solution being within the range of between −15° to 50°C.;
D. separating the magnesium chloride ammonia complex from the ethylene glycol;
E. washing the magnesium ammonia complex with a polar solvent having a lower boiling point than ethylene glycol to remove any ethylene glycol entrained in the magnesium chloride ammonia complex;
F. heating the magnesium chloride ammonia complex to a temperature and for a period of time sufficient to drive off the ammonia, thereby forming anhydrous magnesium chloride; and then,
G. recovering anhydrous magnesium chloride which has a magnesium oxide content less than 0.8% by weight.

3,966,889
PROCESS FOR THE RECOVERY OF SELENIUM FROM WASTE GAS

Hisashi Kakuta; Shigetada Matoba; Kenichi Shimizu, and Satoshi Yamashita, all of Yokohama, Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 384,227, July 31, 1973, abandoned. This application Nov. 14, 1974, Ser. No. 523,747

Int. Cl.² C01B *19/00*

U.S. Cl. 423—510 **7 Claims**

1. A process for the recovery of selenium from combustion waste gas, which comprises:
contacting said combustion waste gas with a first absorbing solution which contains at least one absorbent selected from the group consisting of an alkali metal sulfite and an alkali metal bisulfite, whereby the major portion of the selenium component of said waste gas is absorbed therein, and wherein said waste gas is cooled so that the humidity of said gas is increased;
passing said gas through a moistened glass fiber filter of glass wool having a bulk density of 150–250 kg/m³, so that the residual selenium in said gas is collected thereon;
combining the selenium component collected on said filter with the first absorbing solution; and
acidifying said combined solution to reduce and precipitate said selenium component to metallic selenium.

3,966,890
METHOD OF PRODUCING SOLUTIONS CONTAINING CUPROUS IONS

Alan James Parker; Winfield Earle Waghorne, both of Canberra; Dion Ewing Giles, Sydney; John Howard Sharp, Sydney; Robert Alexander, and David Michael Muir, both of Canberra, all of Australia, assignors to Anumin Pty. Limited, Canberra, Australia

Division of Ser. No. 237,061, March 22, 1972. This application Dec. 17, 1974, Ser. No. 533,660

Claims priority, application Australia, April 2, 1971, 4500/71; April 2, 1971, 4501/71; April 2, 1971, 4502/71; April 28, 1971, 4735/71; June 4, 1971, 5110/71; Sept. 14, 1971, 6281/71; Sept. 24, 1971, 6411/71; Oct. 20, 1971, 6718/71; Oct. 26, 1971, 6798/71; Dec. 14, 1971, 7383/71; Jan. 26, 1972, 7776/72

Int. Cl.² C01G *3/10*; C22B *15/00*, *15/08*

U.S. Cl. 423—512 A **3 Claims**

1. A method of reducing an aqueous cupric sulfate solution to a solution containing cuprous sulfite, cuprous bisulfite or mixtures thereof comprising mixing said aqueous cupric sulfate solution with between 5 and 30% acetonitrile, adding sulfur dioxide and maintaining the pH of the cupric sulfate solution between 1 and 6 until a solution containing cuprous sulfite, cuprous bisulfite or mixtures thereof is formed.

3. A method of leaching copper values as a solution containing cuprous sulfate, cuprous bisulfite or mixtures thereof from a material selected from the group consisting of copper oxides, copper carbonates and copper hydroxides comprising mixing said material in a leaching vesel under an atmosphere of sulphur dioxide with a homogeneous composition containing aqueous cupric sulfate assaying at least 0.05% cupric ion by weight, 5 to 30% by volume of acetonitrile, and at least 50% by volume water, allowing the mixture to react, separating unreacted solids from the mixture and recovering the resulting solution containing cuprous sulfate, cuprous, bisulfite or mixtures thereof.

3,966,891
PROCESS FOR MANUFACTURING SULFUR FROM A SOLUTION OF SODIUM SULFITE

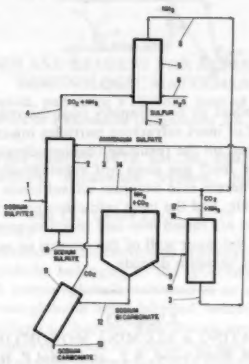
Philippe Renault, Noisy-le-Roi; André Deschamps, Chatou, and Claude Dezael, Maisons-Lafitte, all of France, assignors to Institut Francaise du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed Oct. 15, 1973, Ser. No. 406,348

Claims priority, application France, Oct. 20, 1972, 72.37418

Int. Cl.² C01B *17/04*, *17/60*; C01C *1/244*; C01D *5/08*

U.S. Cl. 423—574 R **10 Claims**



1. A process for manufacturing sulfur from a sodium sulfite solution, comprising the steps of (a) reacting said sodium sulfite solution with ammonium sulfate, $(NH_4)_2SO_4$ to produce a gas containing sulfur dioxide and ammonia and a liquid outflow containing sodium sulfate, (b) reacting said gas with hydrogen sulfide, to produce sulfur, and separating said produced sulfur from the remaining ammonia containing gas, (c) reacting said liquid outflow with carbon dioxide and ammonia to convert sodium sulfate to ammonium sulfate and to form a precipitate of sodium bicarbonate, (d) separating said precipitate from the ammonium sulfate containing liquid outflow and (e) recycling the liquid outflow from step (d) to step (a) for contact with the sodium sulfite solution.

3,966,892
PROCESS FOR PRODUCING TITANIUM DIOXIDE

Shigenori Okudaira; Michiaki Iwakami, and Takefumi Iriye, all of Chigasaki, Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

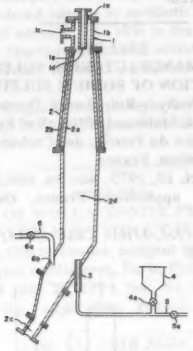
Filed Nov. 13, 1974, Ser. No. 523,454

Int. Cl.³ C01G *23/04*

U.S. Cl. 423—613 **5 Claims**

1. In a process for producing titanium dioxide by the continuous gaseous oxidation of titanium tetrachloride or a titanium

tetrachloride containing gas with oxygen or an oxygen containing gas, the improvement wherein both of said gases are separately preheated and the titanium tetrachloride or titanium tetrachloride containing gas is fed downwardly into the reactor from a burner equipped with a cooling jacket disposed at the upper part of the reactor and the oxygen or oxygen containing gas is fed downwardly through the burner into the reactor for reaction with titanium tetrachloride; and simultaneously, an inert gas and inert refractory particles are injected from the lower part of the reactor toward the inner wall of the reactor so that the inert refractory particles are caused to rise upwardly as a suspension, and the upward flow of the suspension is countercurrently contacted with the downward flow of



the reaction product so as to rapidly cool the reaction product, the amount of inert refractory particles injected is more than 10 wt% based on the resulting titanium dioxide product, and wherein the inert gas does not substantially reach the reaction zone wherein said titanium tetrachloride is oxidized to titanium dioxide; and the inert refractory particles injected with the inert gas are raised into said reaction zone by inertia and impinge on the inner wall of the reactor so as to prevent the deposition of titanium dioxide.

3,966,893

PRECIPITATING α ALUMINA MONOHYDRATE

M. Robert Deroff, Blackwood, N.J., and Elliot P. Hertzenberg, Wilmington, Del., assignors to Philadelphia Quartz Company, Valley Forge, Pa.

Filed Dec. 2, 1974, Ser. No. 528,823

Int. Cl.² C01F 7/02, 7/34

U.S. Cl. 423—628 **12 Claims**

1. A method of preparing dispersible colloidal sized particles of α alumina monohydrate comprising:

a. preparing an aqueous solution of an aluminum salt of a strong acid;

b. conditioning said solution by mixing it with a water miscible organic solvent selected from the group consisting of water miscible aldehydes, ketones and alcohols;

c. mixing the conditioned solution with an aqueous solution of base, thereby forming a mixture of a precipitate and a supernatant liquid;

d. diluting said precipitate and supernatant liquid with water at a temperature between room temperature and just below the boiling point of the organic solvent;

e. agitating and heating the diluted precipitate and supernatant at a temperature between room temperature and just below the boiling point of the organic solvent for 6 to 25 minutes;

f. further heating the diluted precipitate and supernatant liquid at a temperature of 140 to 200°C in an autoclave for ¼ to 1½hours;

g. cooling, filtering and washing the precipitate; and

h. drying the washed precipitate to obtain the product.

3,966,894

METHOD OF PREPARING BARIUM HYDROXIDE

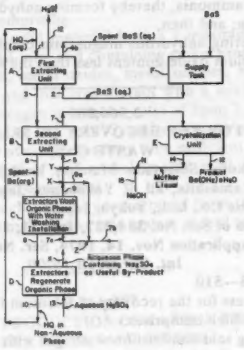
Jean-Pierre Cuer, Colombes, and Nicole Texier, Paris, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Sept. 16, 1974, Ser. No. 506,595

Claims priority, application France, Sept. 25, 1973, 73.34249

Int. Cl.² C01F 11/10

U.S. Cl. 423—638 **8 Claims**



1. A method for obtaining an aqueous solution of barium hydroxide from barium sulfide comprising the steps of

i. contacting an aqueous barium sulfide solution containing barium ions and sulfide ions with a substantially water-insoluble exchange agent containing hydrogen ions, and which is capable of exchanging the hydrogen ions for barium ions, said exchange agent being a dialkyl phosphoric acid having the formula

R and R′ being the same or different straight, branched or cyclic hydrocarbon radical having 6 to 12 carbon atoms, effecting the transfer of barium ions from the aqueous solution to said agent and simultaneously effecting the reaction of the exchanged hydrogen ions with sulfide ions to form hydrogen sulfide gas;

ii. separating the exchange agent containing barium ions from the residual aqueous solution;

iii. contacting the separated exchange agent containing barium ions with an aqueous alkali metal hydroxide solution containing alkali metal ions and hydroxide ions, effecting the transfer of barium ions to the aqueous solution in exchange for alkali metal ions and forming an aqueous solution of barium hydroxide;

iv. separating the aqueous solution of barium hydroxide from the exchange agent containing alkali metal ions.

3,966,895

DEHYDROGENATION WITH A NONACIDIC MULTIMETALLIC CATALYST

Frederick C. Wilhelm, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 348,379, April 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 81,512, Oct. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 15,960, March 2, 1970, abandoned. This application Aug. 27, 1974, Ser. No. 501,113

Int. Cl.² C07C *5/18*

U.S. Cl. 260—668 D 24 Claims

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, hydrogen, and water or water-producing substance, at dehydrogenation conditions, with a nonacidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 5 wt. % nickel, about 0.01 to about 5 wt. Group IVA metal, and about 0.1 to about 5 wt. % of an alkali or alkaline earth metal, wherein the platinum group metal, Group IVA metal, nickel, and alkali or alkaline earth metal are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state, wherein substantially all of the Group IVA metal is present in an oxidation state above that of the elemental metal and wherein substantially all of the alkali or alkaline earth metal is present in an oxidation state above that of the elemental metal.

3,966,896

RADIOIMMUNOASSAY FOR PLASMA RENIN ACTIVITY

Joel Glovsky, Fenton, and James L. Brown, House Springs, both of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Sept. 6, 1974, Ser. No. 503,648

Int. Cl.² A61K *43/00*; G01T *1/16*; G01N *33/00*

U.S. Cl. 195—103.7 24 Claims

1. A radioimmunoassay method for the in vitro determination of the renin activity of an unknown plasma sample, comprising the steps of:

providing an unknown generation sample by mixing the unknown plasma sample with a generation buffer solution and an inhibitor for enzymes which convert angiotensin I to other substances;

incubating said unknown generation sample to generate angiotensin I therein by action of renin upon angiotensinogen, thereby producing a generated unknown plasma sample;

providing a generated unknown radioimmunoassay reaction mixture by mixing said generated unknown plasma sample with a predetermined amount of radioactively labeled angiotensin I, a predetermined amount of an antibody for angiotensin I, and an amount of an assay buffer solution sufficient to provide in said generated unknown reaction mixture renin and angiotensinogen concentrations at which there is no substantial angiotensin I generation at the temperatures to which said generated unknown radioimmunoassay reaction mixture is subsequently exposed;

incubating said generated unknown radioimmunoassay reaction mixture at a temperature of at least about 12°C. so that a competitive binding reaction takes place between the antibody and both labeled and unlabeled angiotensin I;

separating bound angiotensin I from unbound angiotensin I;

determining the relative proportions of bound and unbound labeled angiotensin I in said reaction mixture;

determining the angiotensin I content of said generated unknown reaction mixture by comparison of the relative proportions of bound and unbound labeled angiotensin I in said unknown reaction mixture with the relative proportions of bound and unbound labeled angiotensin I in standard radioimmunoassay reaction mixture containing known amounts of unlabeled angiotensin I; and

determining the renin activity of said unknown plasma sample from the difference between the angiotensin I content of said generated unknown reaction mixture and the angiotensin I content of a nongenerated radioimmunoassay reaction mixture containing a sample of the same unknown plasma.

3,966,897

MEDIUM FOR USE IN BIOASSAY AND METHOD OF USING SAME

Donald W. Renn, Glen Cove, Me, and Calvin A. Saravis, Waban, Mass., assignors to Marine Colloids, Inc., Rockland, Maine

Filed Apr. 2, 1973, Ser. No. 346,966

Int. Cl.² G01N *33/00*; A61K *43/00*; G21H *5/02*

U.S. Cl. 424—1.5 11 Claims

1. A medium for use in bioassay diffusion processes with test substances, said medium comprising a layer of dry material hydratable to a gel through which said test substance can diffuse, and fixed to a restricted localized zone of said layer against diffusive movement therethrough a reagent capable of reaction with said test substance, said reagent being confined to said zone which is smaller than said layer.

3,966,898

METHOD AND REAGENT FOR DETERMINING IMMUNOLOGIC MATERIALS

John A. Sjöquist, and Arne V. Sjödin, both of Uppsala, Sweden, assignors to Pharmacia Diagnostics AB, Uppsala, Sweden

Filed June 19, 1974, Ser. No. 480,915

Claims priority, application Sweden, June 28, 1973, 7309096

Int. Cl.² G01N *21/52*, *33/16*

U.S. Cl. 424—12 3 Claims

1. In the method of qualitatively or quantitatively indicating an immunoglobulin belonging to the IgG-class, the Fab-portion of which immunoglobulin is bound to an antigen or hapten, the immunoglobulin being labelled, before or after binding to the antigen or hapten, with one or more analytically indicatable atoms or groups by contacting said immunoglobulin with a polypeptide labelled with said analytically indicatable atoms or groups, the improvement which comprises using as the polypeptide, a polypeptide which is obtained from Staphylococci and which is able to bind itself to the Fc-portion of said immunoglobulin belonging to the IgG-class.

3,966,899

METHOD OF TREATMENT OF MEDICINES

Yoshinobu Nakai, 2-5-2, Komagome, Toshima, Tokyo; Keiji Yamamoto, 10-510 Shiei Fuseko-Danchi, 206 Hieashi-Naebocho, Higashi, Sapporo, Hokkaido, and Masahiro Nakano, 95-654-53, Hachiken, Nishi, Sapporo, Hokkaido, all of Japan

Filed Mar. 12, 1975, Ser. No. 557,696

Claims priority, application Japan, Sept. 13, 1974, 49-104899

Int. Cl.² A61J *3/00*

U.S. Cl. 424—19 6 Claims

1. The method of manufacturing a pharmaceutical comprising a plurality of pharmacologically active ingredients whereby upon administration to a patient each active ingredient will be released therefrom at substantially the same uniform rate, said method consisting essentially of mixing a plurality of pharmacologically active ingredients with beta-1, 4-glucan, and pulverizing the mixture.

3,966,900

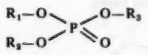
EVAPORATOR SYSTEM COMPRISING A STABILIZED PESTICIDAL PHOSPHORIC ACID ESTER AND METHOD FOR STABILIZING SUCH ESTER ENCLOSED IN AN EVAPORATOR

Claude Hennart, Seraincourt; Bernard Rabussier, Aventon, and Jean-Pierre Mandon, Poitiers, all of France, assignors to Airwick Industries, Inc., Carlstadt, N.J.

Continuation-in-part of Ser. No. 17,918, March 9, 1970, abandoned. This application Dec. 21, 1973, Ser. No. 427,103
Claims priority, application France, Mar. 12, 1969, 69.06860; Mar. 12, 1969, 69.906861; Mar. 12, 1969, 69.06862; Luxemburg, Dec. 18, 1969, 60052
Int. Cl.² A01N 17/12, 9/36
U.S. Cl. 424—27 10 Claims

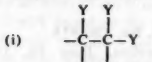
1. In an evaporator system adapted fo emitting insect killing vapors of an insecticide therefrom in a closed area and comprising a liquid or solid composition therein, which can neither be ingested by the insect nor penetrate into it by contact, which composition contains as the essential constituents:

1. as the sole insecticidal substance, from about 8.5 to 99 percent, calculated on the weight of all the ingredients of at least one volatile phosphoric acid ester (A) of the formula:

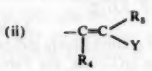


(I)

wherein, R_1 and R_2 are the same or different and represent alkyl radicals containing 1 to 4 carbon atoms and R_3 is a member selected from one of the following groups (i) and (ii):



(II)



(III)

wherein Y is a halogen atom having an atomic weight of at most 80 and
R_4 and R_5 are identical or different and are selected from the group consisting of a hydrogen atom, an aforesaid halogen atom and a methyl, ethyl or propyl radical,

2. from 0.1 to about 10 percent, based on the weight of (A), of a stabilizing agent (B) for stabilizing the volatile phosphoric acid ester (A) and
3. from 0 to about 90 percent, based on the total weight of the composition, of a solid or liquid diluent (C) which is a solvent for at least one of components A and B,

the improvement wherein the stabilizing agent (B) is such as to prevent the self-protonization reaction of the volatile phosphoric acid ester and is selected from the group consisting of at least one diazene compound of the formula:

$$R - N = N - ZH \quad (IV)$$

and of its corresponding tautomeric hydrazonic formula:

$$R - NH - N = Z$$

wherein ZH is a member selected from the group consisting of

and the group

and Z the corresponding tautomeric divalent groups and R, R′, R″ and R‴ having the following meanings:

R represents a radical of hydroaromatic or of aromatic character comprising one, two or three rings, each having 5 or 6 ring members and when said radical contains two or three rings, the rings are condensed together or bound to each other, directly or via an oxygen atom or an —NH—, $-CH_2-$, or

$$-CH=CH-$$

group and when said radical represents three rings, the latter can form a triphenyl methan group; the radical R being selected from the group consisting of

a. carbocyclic radicals of aromatic character having one to three rings and heterocyclic radicals of aromatic character having from one to three rings one of which contains one or two ring hetero atoms chosen from nitrogen, oxygen and sulphur;
b. carbocyclic or heterocyclic radicals with hydroaromatic character having two or three carbocyclic rings each of 5 or 6 ring members and at least two of these rings are condensed together, wherein two or four carbon atoms in one of the rings are saturated and at least one other ring is aromatic;
c. radicals as defined under (a) or (b) substituted by at least one member selected from the group consisting of one or two phenylazo, naphthylazo or arylazoarylazo, in which each of the aryl radicals is phenyl or naphthyl, or 4-pyrazolyl-azo groups; and
d. a radical as defined under (a), (b), or (c) with at least one of its rings bearing one to four substituents selected from fluorine, chlorine, bromine, iodine, keto oxygen, hydroxy, carboxy, alkyl having from one to six carbon atoms, alkylene having from two or five carbon atoms, cycloalkyl having five or six carbon atoms, amino, alkanoylamino having up to five carbon atoms, mono-benzoylamino, alkoxy having from one to five carbon atoms, benzyloxy, nitro, sulpho, cyano, carbamoyl, benzoyl, amino substituted by one or two groups selected from the group consisting of alkyl groups having one to four carbon atoms, phenyl groups and benzyl groups, alkoxycarbonyl having from two to six carbon atoms, alkylsulphonyl having from one to five carbon atoms, sulphamoyl, the nitrogen atom of which is unsubstituted or substituted by one or two hydrocarbon radicals having a total of one to eight carbon atoms, alkanoyloxy having at most eighteen carbon atoms, and alkenoyloxy having at most eighteen carbon atoms, alkanoyl having up to five carbon atoms, and dialkylamino-alkyl having a total of from three to nine carbon atoms; and

R′ is a member selected from the group consisting of benzyl, alkyl of from one to seventeen carbon atoms, alkenyl of two to eight carbon atoms and a radical R as defined under any one of (a) to (d) as defined above and

R″ is a member selected from the group consisting of a radical R′ as defined above, an unsubstituted phenylazo or naphthylazo group and a phenylazo or naphthylazo group substituted by methyl or ethyl; or

R′ and R′ taken together represent a divalent hydrocarbon radical having a total of four to fourteen carbon atoms which is a straight or branched chain radical or a chain radical containing an aryl ring condensed to the chain, any substituent of said hydrocarbon radical being selected from the substituents defined under (d), and groups of the formula =NX, in which X represents hydrogen, alkyl having from one to five carbon atoms or phenyl, and the group of formula:

represents a radical R as defined under (a) to (d) above other than a group

as defined above wherein R′ and R″ are taken together, or (ii) a salt of a compound as defined under (i) above being at least one group capable of salt formation or, (iii) a metal complex of a compound or salt as defined under (i) or (ii) bearing one or two groups capable of metal complex formation selected from hydroxy, carboxy, amino, mono (C_1–C_4 alkyl) amino, phenylamino, phenylsulphonamino and (C_1–C_4 alkyl) sulphonamido groups, said diazene being soluble in said composition.

3,966,901

DENTIFRICE PREPARATION

Douglas Charles Cullum, East Molesey, and Joan Collinge, Cheadle, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 389,628, Aug. 21, 1973, abandoned, which is a continuation of Ser. No. 210,559, Dec. 21, 1971, abandoned. This application Feb. 21, 1975, Ser. No. 551,870

Claims priority, application United Kingdom, Dec. 29, 1970, 61614/70

Int. Cl.² A61K *7/18*

U.S. Cl. 424—52 **4 Claims**

1. A dental cream preparation comprising a water-soluble alkali metal monofluorophosphate in amount to provide about 0.01–1% by weight of fluorine and about 20–99% by weight of compatible polishing material at least a major part of which is dimagnesium orthophosphate trihydrate.

3,966,902

POLYMER COMPLEX CARRIERS FOR AN ACTIVE INGREDIENT

Richard C. Chromecek, Goshen, Conn., assignor to Airwick Industries, Inc., Carlstadt, N.J.

Continuation-in-part of Ser. No. 252,823, May 21, 1972, Pat. No. 3,886,125. This application Mar. 14, 1975, Ser. No. 558,345

Int. Cl.² A61K *7/44, 7/46, 31/78*

U.S. Cl. 424—59 **12 Claims**

1. A composition comprising an effective amount of an active ingredient dispersed in a polymer complex consisting essentially of (1) a polymer which is a homopolymer or copolymer comprising a monomer having a hydrophilic functional group and (2) from 0.1 to 90 mol percent based on the hydrophilic functional groups present in said homopolymer or copolymer, of aluminum, zinc, or zirconium metal bound in complex form, said monomer being selected from the group consisting of hydroxyalkyl esters of α,β-unsaturated carboxylic acids and ethylenically unsaturated monomers containing an amino group, said copolymers further comprising from 0.5 to 60 mol percent of an ethylenically unsaturated monomer free of said hydrophilic functional groups.

3,966,903

SULFITE OR BISULFITE HAIR-WAVING COMPOSITION CONTAINING A WAVE ACCELERATING AGENT

Kenji Torii, Tokyo; Tatsuya Ozawa, Chofu; Kimio Ono, Hidaka; Koichi Iwabe, and Hiroumi Horikawa, both of Yokohama, all of Japan, assignors to Shiseido Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1974, Ser. No. 462,603

Claims priority, application Japan, May 4, 1973, 48-50141

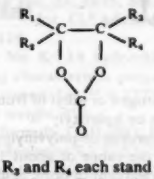
Int. Cl.² A61K *7/09*

U.S. Cl. 424—71 **14 Claims**

1. A hair-waving composition which comprises

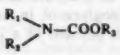
A. from 1 to 40% by weight of a main waving agent selected from the group consisting of a water soluble sulfite and a water soluble hydrogen sulfite and

B. from 5 to 70% by weight of a wave accelerating agent selected from the group consisting of an alkylene carbonate of the formula:



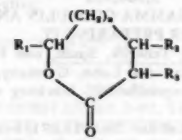
(I)

wherein R_1, R_2, R_3 and R_4 each stand independently for hydrogen, methyl or ethyl, an alkyl carbamate of the formula:



(II)

wherein R_1, R_2 and R_3 each stand independently for hydrogen, methyl, ethyl or propyl and a γ- or α- lactone of the formula:



(III)

wherein R_1, R_2 and R_3 each stand for hydrogen or methyl, and *n an for aan integer of* 0 or 1, and mixtures thereof, and

C. water wherein the total amount of (A) and (B) ranges from 10 to 80% by weight.

3,966,904

QUATERNARY AMMONIUM CO-POLYMERS FOR CONTROLLING THE PROLIFERATION OF BACTERIA

Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Division of Ser. No. 511,759, Oct. 3, 1974, Pat. No. 3,928,323, which is a continuation-in-part of Ser. No. 425,931, Dec. 18, 1973, Pat. No. 3,874,870. This application July 7, 1975, Ser. No. 593,733

Int. Cl.² A61K *31/14, 31/785*

U.S. Cl. 424—78 **1 Claim**

1. A method of controlling the proliferation of bacteria which comprises applying to said bacteria an effective amount sufficient to inhibit their growth, of a product formed by the condensation of a mixture of difunctional tertiary amines and a molar quantity of 1,4-dichloro-2-butene that is substantially equal to the molar sum of the mixture of difunctional tertiary amines, said mixture of difunctional tertiary amines being selected from the group consisting of (a) 1,4-bis-(dimethylamino)-2-butene and N,N,N′,N′-tetramethylethylenediamine and (b) 1,4-bis-(dimethylamino)-2-butene and 1,4-bis-(methyl dodecylamino)-2-butene.

3,966,905

STABILIZED CATECHOL AMINE SOLUTIONS

Rebecca F. Nite, Sunnyvale, Calif., assignor to Barnes-Hind Pharmaceuticals, Inc., Sunnyvale, Calif.

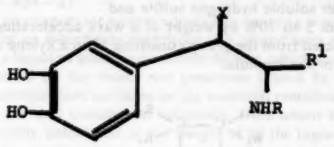
Continuation of Ser. No. 365,013, May 29, 1973, abandoned. This application Nov. 25, 1974, Ser. No. 526,660

Int. Cl.² A61K 31/135

U.S. Cl. 424—80 5 Claims

1. A physiologically useful catechol amine solution having enhanced stability comprising:

in an aqueous medium from 0.1 to 10 weight percent of a catechol alkyl amine of from 8 to 12 carbon atoms of the formula:



wherein R and R¹ are hydrogen or alkyl of from 1 to 3 carbon atoms, and X is hydrogen or hydroxyl;

from 0.1 to 5 weight percent of polyvinylpyrrolidone of a molecular weight in the range of about 1–10 × 10⁴ and from 0.1 to 2. weight percent of boric acid as borate, and a physiologically acceptable antioxidant selected from the group consisting of ascorbic acid, erythorbic acid, acetylcysteine and thioglycerol in an amount of from about 0.2 to 5 weight percent at a pH in the range of about 5.5 to 8.5.

3,966,906

DISAGGREGATED GAMMA GLOBULIN AND PROCESS FOR PREPARING IT

Hermann E. Schultze, Tenerife, Spain, and Hans Gerhard Schwick, Marburg an der Lahn, Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Germany

Continuation-in-part of Ser. No. 115,071, Feb. 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 584,689, Oct. 6, 1966, abandoned, which is a continuation-in-part of Ser. No. 153,214, Nov. 17, 1961, abandoned. This application Apr. 8, 1974, Ser. No. 459,188

Claims priority, application Germany, Oct. 11, 1961, 64342

Int. Cl.² A23J 1/06; A61K 37/06, 39/40, 39/42

U.S. Cl. 424—85 9 Claims

1. The process for preparing a human gamma globulin disaggregated into sub-units by enzymatic action and having no significant effect on the complement system, which process comprises (1) treating a crude antibody-containing gamma globulin fraction of human serum, obtained by precipitating blood serum with ammonium sulfate or alcohol, at a pH between 3.5 and 5 and at a temperature from 25°C. to 45°C. with from 50,000 MTU to 100,000 MTU of pepsin per 100 grams of protein to be degraded, while continually controlling the anticomplement activity, for a period ranging from 12 to 48 hours, until the anti-complement activity, measured by combining a 1 ml sample of the disaggregated gamma globulin with 1 ml of a solution containing 100 units of guinea pig complement in the presence of a buffer solution and heating for 1 hour at 30°C., is such that more than 20 units of the complement in the original complement solution must not be inactivated; (2) removing low molecular weight decomposition products from the disaggregated gamma globulin by filtration; and (3) filtering the disaggregated gamma globulin under sterile conditions.

7. A preparation of human gamma globulin disaggregated into sub-units by enzymatic action and suitable for intravenous injection, prepared by the process of claim 1.

3,966,907

VACCINES AGAINST FELINE LEUKEMIA

William Fleming Hoggan Jarrett; James Oswald Jarrett, and Lindsay Joan Mackey, all of Glasgow, Scotland, assignors to University of Glasgow, Glasgow, Scotland

Filed Sept. 13, 1974, Ser. No. 505,625

Claims priority, application United Kingdom, Sept. 18, 1973, 43642/73

Int. Cl.² A61K 39/12

U.S. Cl. 424—89 4 Claims

1. A vaccine for the prevention of diseases caused by Feline leukemia virus which comprises in unit dosage form about 10^7–10^9 cells infected with live Feline leukemia virus said cells having virus-associated antigen or their surface.

3,966,908

METHOD OF TREATING DEGENERATIVE JOINT AFFLICTIONS

Leslie L. Balassa, Blooming Grove, N.Y., assignor to Lescarden Ltd., Goshen, N.Y.

Continuation of Ser. No. 420,257, Nov. 29, 1973, abandoned. This application July 10, 1975, Ser. No. 594,697

Int. Cl.² A61K 35/32

U.S. Cl. 424—95 4 Claims

1. A method of treating degenerative joint afflictions to obtain a protracted symptomatic remission period, the alleviation of pain and the promotion of increased joint mobility in a human suffering from said degenerative joint affliction which comprises subcutaneously administering to said human in a distensible area of the body and in a plurality of individual treatments a total dose of between about 150 and 1,000 cc consisting essentially of a liquid extract of essentially pure granulated cartilage material, substantially free from adhering tissue, and subcutaneously administering to said human at least about 10 cc of said liquid extract in each of said individual treatments.

3,966,909

SOLVENT EXTRACTION OF ALUMINUM

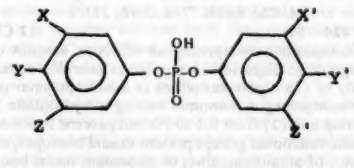
James K. Grunig, and Rodney J. Anderson, both of Tucson, Ariz., assignors to The Anaconda Company, New York, N.Y.

Continuation-in-part of Ser. No. 444,004, Feb. 20, 1974, abandoned. This application Mar. 13, 1975, Ser. No. 558,149

Int. Cl.² B01D 11/04; G01F 7/00

U.S. Cl. 423—112 7 Claims

1. A process for recovering aluminum from an impure acidic solution containing aluminum and iron comprising contacting the said solution with a symmetrical bis(3,5-C_1–C_{10} alkyl-substituted pheny) hydrogen phosphate to extract the aluminum and stripping the extract to separate the aluminum from the extract formed, said phosphate having the structural formula:



wherein each of X and Z is a C_1–C_{10} alkyl group, Y is selected from hydrogen and a C_1–C_8 alkyl group, X', Y', and Z' correspond, respectively, to X, Y, and Z, and when Y and Y' are greater than C_1, X, X', Z and Z' are at least 3 carbon atoms longer in chain length.

3,966,910

METHOD FOR TREATING HYPERCHOLESTEROLEMIA WITH MEDIOCIDIN

Carl P. Schaffner, Trenton, N.J., and Harry W. Gordon, Bronx, N.Y., assignors to Schmid Laboratories, Inc., Little Falls, N.J.

Continuation of Ser. No. 24,797, April 1, 1970, abandoned, which is a continuation of Ser. No. 627,313, March 31, 1967, Pat. No. 3,627,879. This application Jan. 26, 1972, Ser. No. 221,062

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—115 3 Claims

1. A process for treating hypercholesterolemia in a large mammal afflicted with hypercholesterolemia which comprises orally administering an effective dose for treating hypercholesterolemia of mediocidin to said mammal.

3,966,911

METHOD FOR TREATING HYPERCHOLESTEROLEMIA WITH N-ACETYL CANDICIDIN

Harry W. Gordon, Bronx, N.Y., and Carl P. Schaffner, Trenton, N.J., assignors to Schmid Laboratories, Inc., Little Falls, N.J.

Division of Ser. No. 221,062, Jan. 26, 1972, which is a continuation of Ser. No. 24,797, April 1, 1970, abandoned, which is a continuation of Ser. No. 627,313, March 31, 1967, Pat. No. 3,627,879. This application Jan. 7, 1974, Ser. No. 431,501

Int. Cl.[2] H61K *35/00*

U.S. Cl. 424—117 3 Claims

1. A process for the treatment of hypercholesterolemia in a large mammal afflicted with hypercholesterolemia which comprises orally administering to said mammal an effective dose for treating hypercholesterolemia of N-acetyl candicidin.

3,966,912

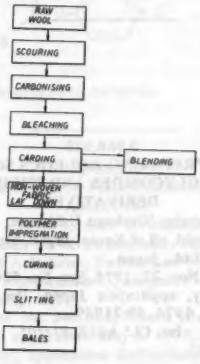
METHOD OF PREPARING TOBACCO SMOKE FILTER

Graeme David Fair, Toorak; Derek Lesley Arthur Hasmall, West Brunswick; William Patrick Ryan, Lugarno, and Edwin John Sellman, Burwood, all of Australia, assignors to Rothmans of Pall Mall (Australia) Limited, Granville and Lantor of Australia Pty. Ltd., Sydney, both of, Australia

Division of Ser. No. 399,306, Sept. 21, 1973, abandoned. This application Aug. 1, 1975, Ser. No. 601,136

Int. Cl.[2] B29D *23/10*

U.S. Cl. 264—118 9 Claims



1. A method of making a tobacco smoke filter element, said method comprising:

forming a dry web of bonded non-woven fabric at least partly from scoured, carbonized and bleached wool fibres by the random lay method;

immersing the said dry web in a bath of a polymeric binder;

drying and curing said polymeric binder;

slitting said web to form strips of a predetermined width;

passing each said strip through heated corrugated rolls thereby heating and imparting to said strip a quasi-corrugation in the longitudinal direction thereof; and

feeding each strip to the garniture of a conventional filter rod manufacturing machine to form a filter element.

3,966,913

ANTIBIOTICS NO. K-73 AND METHOD FOR PRODUCING THE SAME

Akiro Ito, Saitama; Yasushi Ichikawa, Fuji; Sadayuki Horiguchi, Fuji; Shyoji Shirota, Fuji; Yasuo Kayama; Shiro Chihara, both of Tokyo; Isoko Haneda, Yamato; Katsumi Hasuda, Niiza, and Shyoichi Takano, Hanno, all of Japan, assignors to Kayaku Antibiotic Research Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1975, Ser. No. 543,500

Int. Cl.[2] A61K *35/74*

U.S. Cl. 424—119 5 Claims

4. Antibiotic No. K-73A hydrochloride which is described by the following characteristic properties:

1. Specific rotation: $[\alpha]_D^{25} + 177°$ (C=2, chloroform)
2. Molecular weight: 496
3. Chemical formula: $C_{24}H_{33}NO_8.HCl$
4. Elemental analysis (%): C 57.73, H 6.39, N 2.35
5. Melting point: 180°C (decomposition)
6. Ultraviolet absorption spectrum: FIG. 1
7. Infrared absorption spectrum: FIG. 2
8. Solubility:
   Soluble in water, methanol, ethanol, acetone, ethyl acetate and benzene. Insoluble in n-hexane and petrolem;
9. Color reaction:
   Balyer, Anthron, Fehling and Quinone reactions are positive; Ninhydrin, Biuret and Elson-Margan reactions are negative;
10. Nature
    Basic substance (pKa=9.5).

3,966,914

ANTIBIOTIC SUBSTANCES B-41, THEIR PRODUCTION AND THEIR USE AS INSECTICIDES AND ACARICIDES

Atsushi Aoki; Rikiya Fukuda; Toshio Nakayabu, all of Sapporo; Keijiro Ishibashi, Hiro; Chiyoko Takeichi, Hiro, and Mitsuo Ishida, Hiro, all of Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Division of Ser. No. 394,073, Sept. 4, 1973, which is a continuation-in-part of Ser. No. 365,188, May 30, 1973. This application Oct. 31, 1974, Ser. No. 519,668

Claims priority, application Japan, June 8, 1972, 47-57058

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—122 2 Claims

1. An antibiotic substance B-41-A_2 effective against harmful insects, said substance being a colorless amorphous powder form which is difficultly soluble in water and easily soluble in n-hexane, benzene, acetone, ethanol and chloroform and has a molecular formula of $C_{36}H_{56}O_{10}$, a composition of 71.73% carbon and 8.26% hydrogen and the balance oxygen and the following properties; molecular weights of 672.1 obtained by an osmometric method in acetone and of 672 according mass spectrum; a specific rotatory power of $[\alpha]_D^{20} = +54°$ obtained with the concentration of a sample of 5 mg./2 ml. and the length of a layer of 10 cm. in acetone; no pKa at a pH ranging from 2 to 12; absorption maximum in the ultraviolet region of the spectrum at 245 mμ; characteristic absorption bands in the infrared region shown in FIG. 11; nuclear magnetic resonance spectrum in $(CD_3)_2CO$ shown in FIG. 20; main peaks of the mass spectrum 672, 181, 153 and 151 obtained under the conditions of 75 eV at ionization room temperature of 200°C. and a sample temperature of 120°–190°C.; and the following color reactions according to a thin layer chromatography, yellow to iodine/chloroform, negative to ninhydrin,

reddish purple to sulfuric acid and yellow to potassium permanganate.

3,966,915

TREATMENT OF HEART DISEASES

Luciano Caprino, Rome, Italy, assignor to Istituto Farmacologico Serono S.p.A., Rome, Italy

Continuation of Ser. No. 324,572, Jan. 18, 1973, abandoned. This application June 19, 1974, Ser. No. 480,746
Claims priority, application Italy, Feb. 11, 1972, 48280/72
Int. Cl.² A61K *37/00*
U.S. Cl. 424—177 6 Claims

1. A method for the treatment of heart disease by increasing the contraction amplitude of the heart which comprises administering to man a pharmaceutically effective amount of about 0.1 to 1 gram per day of phosvitin.

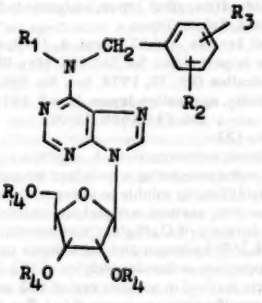
3,966,916

N(6)-DISUBSTITUTED ADENOSINE COMPOUNDS AND THERAPEUTIC COMPOSITIONS

Wolfgang Kampe, Heddesheim; Erich Fauland; Kurt Stach, both of Mannheim-Waldhof; Harald Stork, Mannheim-Feudenheim, and Felix Helmut Schmidt, Mannheim-Seckenheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim-Waldhof, Germany

Division of Ser. No. 393,859, Sept. 4, 1973, Pat. No. 3,880,829. This application Nov. 21, 1974, Ser. No. 525,795
Claims priority, application Germany, Sept. 9, 1972, 2244328
Int. Cl.² A61K *31/70*
U.S. Cl. 424—180 29 Claims

1. Therapeutic composition having anti-lipolytic, anti-hyperlipaemic and anti-hypercholesterolaemic action comprising a pharmaceutically acceptable carrier and, in effective amounts, an N(6)-disubstituted adenosine compound of the formula:



wherein

R_1 is lower alkyl of up to 8 carbon atoms substituted by at least one of hydroxyl, alkoxy or acyloxy of up to 8 carbon atoms each; cycloalkyl of from 3 to 9 carbon atoms; or lower alkenyl of up to 8 carbon atoms;

R_2 and R_3 are individually hydrogen, halogen, nitro, lower alkyl, lower alkoxy or lower alkylthio of up to 8 carbon atoms; and

R_4 is hydrogen or acyl of up to 8 carbon atoms;

and the pharmacologically acceptable salts thereof.

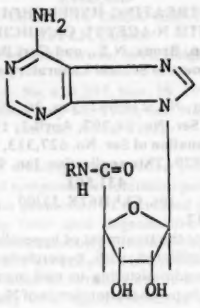
3,966,917

PLATELET AGGREGATION INHIBITORS

Raj Nandan Prasad, Pierrefonds, Canada, and Herman Hal Stein, Skokie, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 492,949, July 30, 1974, Pat. No. 3,914,414, which is a division of Ser. No. 370,084, June 14, 1973, Pat. No. 3,864,483, which is a division of Ser. No. 236,980, March 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 125,893, March 18, 1971, abandoned. This application June 26, 1975, Ser. No. 590,548
Int. Cl.² A61K *27/12*
U.S. Cl. 424—180 7 Claims

1. A method of inhibiting platelet aggregation in a patient having symptoms of a thrombosis, comprising administering to said patient a therapeutic amount of a compound of the formula:



wherein R is H, CH_3, CH_3CH_2, $(CH_3)_2CH$,

$CH_2{=}CHCH_2$, or $CH_3(CH_2)_2$.

3,966,918

METHOD OF PREPARING AQUEOUS SOLUTIONS OF STEROL GLYCOSIDES AND THEIR ESTER DERIVATIVES

Masanobu Kawamata; Hirokazu Ushimaru; Akira Sano, and Yutaka Takahashi, all of Kyoto, Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

Filed Nov. 22, 1974, Ser. No. 526,224
Claims priority, application Japan, Dec. 12, 1973, 48-140922; Feb. 23, 1974, 49-21749
Int. Cl.² A61K *31/705*
U.S. Cl. 424—182 11 Claims

1. A method of preparing an aqueous solution suitable for oral or injectable administration of an anti-inflammatory sterol glycoside or an ester thereof which comprises dissolving said sterol glycoside or an ester thereof in ethanol and subsequently adding to the solution polyoxyethylene hydrogenated castor oil and water.

3,966,919
O,O,O',O'-TETRAALKYL, O,O'-VINYLENEDI-p-PHENYLENE PHOSPHOROTHIOATES AND COMPOSITIONS CONTAINING THE SAME FOR THE CONTROL OF SIPHONAPTERA INFESTATIONS

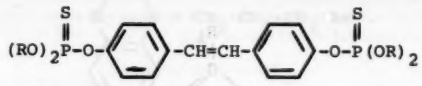
Stephen David Levy, Trenton; Gordon Paul Poeschel, Kinnelon, and Michael Stanley Schrider, South Bound Brook, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 460,257, April 11, 1974, Pat. No. 3,907,936. This application Feb. 12, 1975, Ser. No. 549,220

Int. Cl.[2] A01N 9/36

U.S. Cl. 424—206 12 Claims

1. A composition useful in controlling infestations of a domestic warm-blooded animal with Siphonaptera which comprises from 1 to about 90% of a compound of the formula:



wherein each R is the same and is C_1–C_4 alkyl in association with a carrier.

3,966,920
O,S-DIALKYL-O-(2-CYANOPHENYL)-THIONOTHIOL-PHOSPHORIC ACID ESTERS AND INSECTICIDAL AND ACARICIDAL COMPOSITIONS AND METHOD

Hans-Jochem Riebel, Wuppertal; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

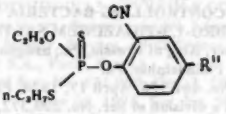
Filed Dec. 4, 1974, Ser. No. 529,660

Claims priority, application Germany, Dec. 5, 1973, 2360548

Int. Cl.[2] A01N 9/36; C07F 9/18

U.S. Cl. 424—210 9 Claims

1. A 2-cyanophenyldithiophosphoric acid ester of the formula



in which R'' is hydrogen or bromine.

3,966,921
CERTAIN PESTICIDAL PHOSPHORUS CONTAINING AMIDINES

Ernst Beriger, Allschwil; Odd Kristiansen, Reinach; Kurt Rufenacht, Basel, all of Switzerland, and Jörg Bader, deceased, late of Arlesheim, Switzerland (by Dagmar Bader-Ludwig, legal representative), assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

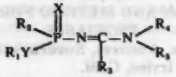
Division of Ser. No. 340,805, March 13, 1973, Pat. No. 3,882,103. This application May 5, 1975, Ser. No. 574,799

Claims priority, application Switzerland, Mar. 17, 1972, 4054/72

Int. Cl.[2] A01N 9/36

U.S. Cl. 424—211 11 Claims

1. An insecticidal, acaricidal and nematocidal composition comprising an insecticidally, acaricidally and nematocidally effective amount of a compound of the formula



wherein

R_1 represents phenyl, or phenyl mono- to trisubstituted by halogen, mono- or disubstituted by C_1–C_4-alkyl, C_1–C_4-alkylthio, nitro, cyano or trifluoromethyl, or monosubstituted by C_1–C_4-carbalkoxy,

R_2 represents methyl, methoxy, ethyl, ethoxy or phenyl,

R_3 represents hydrogen or methyl,

R_4 and R_5 represent methyl, ethyl, n-propyl, isopropyl or allyl,

X and Y represent oxygen or sulphur, or

R_4 and R_5 with the nitrogen atom to which they are bound form the morpholino, piperidino or pyrrolidino ring, or

R_3 with R_4 or R_5 form a pyrrolidino or piperidino ring, whereby then the group R_4 or R_5 not participating in the ring formation represents methyl or ethyl,

together with a suitable inert carrier therefor.

3,966,922
COMPOSITION FOR POULTRY AND LIVESTOCK

Taneji Okamoto, Toyonaka; Kuniyoshi Fujie, Takatsuki, and Sadao Kondo, Kawani, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed July 23, 1971, Ser. No. 165,695

Int. Cl.[2] A61K 31/65

U.S. Cl. 424—227 6 Claims

1. A composition for poultry and livestock, which is stable in aqueous solution, which comprises from 1 to 200 parts by weight of a tetracycline compound selected from the group consisting of tetracycline, oxytetracycline, demethyltetracycline, doxycycline, chlortetracycline, demethylchlortetracycline, minocycline, methacycline and salts thereof with metaphosphoric acid, phosphoric acid, sodium, hydrochloric acid and sulphuric acid, 1 part by weight of one of vitamin B_2 compounds selected from the group consisting of vitamin B_2, flavin mono-nucleotide and flavin adenine dinucleotide and from 0.5 to 20 parts by weight of vanillin.

3,966,923
MEDICAMENTS INTENDED FOR THE PREVENTION AND TREATMENT OF ISCHEMIC DISTURBANCES

Hubert Serre, Paris, France, assignor to Pierre Fabre S.A., Paris, France

Continuation-in-part of Ser. No. 366,608, June 4, 1973, abandoned. This application Aug. 4, 1975, Ser. No. 601,303

Claims priority, application France, June 5, 1972, 72.20390

Int. Cl.[2] A61K 31/625

U.S. Cl. 424—232 18 Claims

1. Pharmaceutical composition useful in the treatment of circulatory insufficiency comprising

a. a vasotrope compound selected from the group consisting of dihydroergocristine, papaverine, and a pharmaceutically acceptable salt of such vasotrope compound, and

b. a thrombocytotropic substance selected from the group consisting of dimethylaminoethanol acetyl salicylate and salt forms thereof which are pharmaceutically useful, the combined amount of said compound and said substance being sufficient to inhibit platelet aggregation to an extent greater than the additive effects of the individual components, (*a*) and (*b*) being present in amounts so as to provide the components in a proportion of about one part of the vasotrope compound (*a*) to about one to 250 parts of the thrombocytotropic substance (*b*).

3,966,924

COMPOSITION AND METHOD FOR TREATING PSORIASIS

Torsten Fredriksson, Vasteras, Sweden, assignor to Allergan Pharmaceuticals, Irvine, Calif.

Filed Nov. 13, 1974, Ser. No. 523,241
Int. Cl.² A61K *31/56*
U.S. Cl. 424—240 4 Claims

1. A method for treating psoriasis in humans comprising the topical administration to a human suffering from psoriasis of an effective dose for treating psoriasis of a composition comprising as active ingredients, from about 0.025 to about 0.1% by weight of β-methasone valerate and about 1 to about 5% of 5-fluorouracil.

3,966,925

LUBRICANT FOR FITTING AND TRIAL MOUNTING OF PROSTHODONTIC APPLIANCES

Arthur Milton Bell, 211 Chadwick Road, Teaneck, N.J. 07666

Division of Ser. No. 326,575, Jan. 26, 1973, Pat. No. 3,861,041, which is a continuation-in-part of Ser. No. 184,949, Sept. 29, 1971, abandoned. This application Dec. 24, 1974, Ser. No. 536,270
Int. Cl.² A61K *31/56*
U.S. Cl. 424—240 10 Claims

1. A lubricating compound for the fitting, trial mounting and removal of prosthodontic appliances, said compound including: (a) a stable, non-toxic, non-setting, water soluble, greaseless base material providing at least 80 percent of the compound, said base material being characterized as having a lubricating quality which quality is not materially affected by storage under reasonable conditions and also during intimate contact with the environs of the mouth, appliance and teeth preparations, said base having a consistency sufficiently stiff to prevent fluid flow by gravity; (b) an anti-inflammatory agent provided by Fluocinolone Acetonide of less than one-quarter of 1 percent of the compound and sufficient to provide a desensitizing effect on the prepared teeth when brought into intimate contact therewith, and (c) a bacteriostatic agent also providing less than 5 percent of the compound and sufficient to prevent noxious odors from forming and to also prevent a proliferation of bacteria from infiltering the restoration and prepared teeth, gingival tissue and other mouth environs during periods of provisional function of the lubricant.

3,966,926

COMPOSITION OF A STEROIDAL[2,3-d]-ISOXAZOLE AND METHOD OF USE THEREOF

Gordon O. Potts, Chatham, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Mar. 26, 1975, Ser. No. 562,122
Int. Cl.² A61K *31/58*
U.S. Cl. 424—241 2 Claims

1. A method for disrupting pregnancy in a female mammal which comprises administering orally to said mammal, subsequent to implantation of a fertilized ovum in said mammal, an abortifaciently effective amount of 17β-hydroxy-4,4,17α-trimethylandrost-5-eno[2,3-d]isoxazole or a pharmaceutically acceptable ester thereof.

3,966,927

METHODS FOR INDUCING PARTURITION IN CATTLE WITH CERTAIN INTRAVENOUSLY-INJECTED SYNTHETIC GLUCOCORTICOIDS

Clarence E. Bininger, Box 1952, Orofino, Idaho 83544

Filed Dec. 16, 1974, Ser. No. 532,769
Int. Cl.² A61K *31/56, 31/58*
U.S. Cl. 424—243 3 Claims

1. In a method of bovine parturition induction with synthetic glucocorticoids, the improvement which consists in intravenously administering to cows, pregnant for at least about 235 days, 10 to 60 mg of a long-lasting parturition-inducing 21-esterified glucocorticoid whereby parturition with low incidence of retained placenta and in-utero fetal and post-partum calf mortality takes place in about two to three days.

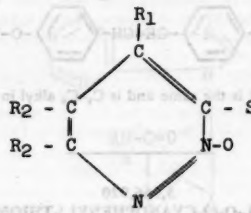
3,966,928

NOVEL DERIVATIVES OF PYRIDAZINE-2-OXIDE

Miriam L. Douglass, Piscataway, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 207,536, Dec. 13, 1971, abandoned. This application Feb. 21, 1974, Ser. No. 444,597
Int. Cl.² A61K *31/555, 31/495*; C11D *3/48*
U.S. Cl. 424—245 13 Claims

1. A topical antimicrobial composition for improving the condition of the hair and skin comprising about 0.1 to 3% by weight of a compound of the formula



wherein R_1, R_2 and R_3 are each hydrogen; R_4 is a metal selected from alkali metals, alkaline earth metals, transistion metals, group IIIA metals, IVA metals, VA metals, and a quaternary ammonium ion of the formula $R_5R_6R_7R_8N^+$ wherein R_5, R_6, R_7 and R_8 are each independently hydrogen, and $C(NH_2)_3X$ wherein X is selected from the group consisting of halide, sulfate, nitrate, acetate, tartarate, citrate and saccharinate and a sufficient amount of a compatible, non-toxic cosmetic vehicle.

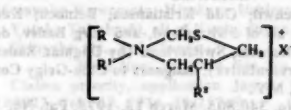
3,966,929

PROCESS FOR CONTROLLING BACTERIA WITH TETRAHYDRO-1,3-THIAZINIUM SALTS

Ludwig Konrad Huber, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 461,556, April 17, 1974, Pat. No. 3,919,422, which is a division of Ser. No. 220,372, Jan. 24, 1972, Pat. No. 3,821,210. This application June 6, 1975, Ser. No. 584,330
Int. Cl.² A01N *9/12*
U.S. Cl. 424—246 4 Claims

1. The method of killing and inhibiting the growth of bacteria comprising contacting the bacteria with an effective amount of tetrahydro-1,3-thiazinium salt represented by the formula



where X is an anion selected from the group consisting of chloride, bromide, iodide, acetate, formate, perchlorate and tosylate, R^2 is hydrogen or hydroxyl, and R and R^1 are independently alkyl having one to 20 carbon atoms or alkyl having one to 20 carbon atoms substituted with one or two hydroxyl groups, the total of the number of carbon atoms in $R + R^1$ being from about 12 to 24.

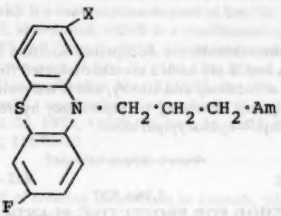
3,966,930

PHENOTHIAZINE DERIVATIVES, COMPOSITIONS THEREOF AND METHODS OF PREPARATION THEREOF

Jorn Lasse Martin Buus, Bjaeverskov, and Niels Lassen, Gentofte, both of Denmark, assignors to Kefalas A/S, Copenhagen-Valby, Denmark

Filed May 30, 1974, Ser. No. 474,530
Claims priority, application United Kingdom, June 8, 1973, 27527/73
Int. Cl.² C09D *279/20, 279/22*
U.S. Cl. 424—247 25 Claims

1. A compound selected from the group consisting of 1) a 7-fluoro substituted phenothiazine of the formula:



wherein "Am" is selected from the group consisting of $N(CH_3)_2$ and

X is selected from the group consisting of —Cl, —CF_3, —$CO{\cdot}CH_3$ and —$SO_2{\cdot}N(CH_3)_2$, Y is selected from the group consisting of >NH, >N·CH_3, >N·$CH_2{\cdot}CH_2OH$, >N·$CH_2{\cdot}CH_2OAc$ >CH·$CH_2{\cdot}CH_2OH$ and >CH·$CH_2{\cdot}CH_2OAc$, and —Ac is an acyl radical of an aliphatic carboxylic acid having one to seventeen carbon atoms inclusive, 2) a N-oxide thereof, and 3) an acid addition salt thereof with a pharmaceutically acceptable acid.

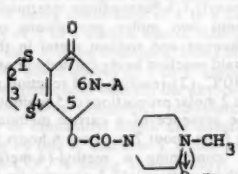
3,966,931

1,4-DITHIINO[2,3-c]PYRROLE COMPOSITIONS

Claude Jeanmart, Brunoy; André Léger, Paris, and Mayer Naoum Messer, Bievres, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 421,060, Dec. 3, 1973. This application June 24, 1975, Ser. No. 589,871
Claims priority, application France, Dec. 4, 1972, 72.43054; Oct. 19, 1973, 73.37402
Int. Cl.² C07D *409/14*
U.S. Cl. 424—250 8 Claims

1. A pharmaceutical composition consisting essentially of, as active ingredient, a 1,4-dithiino[2,3-c]pyrrole of the formula:



wherein A is phenyl, 2-pyridyl, 3-pyridazinyl, 2-quinolyl or 1,8-naphthyridin-2-yl, or a said radical singly substituted by halogen, alkyl of 1 through 4 carbon atoms, alkoxy of 1 through 4 carbon atoms, cyano or nitro, and *n* is zero or 1, or a non-toxic pharmaceutically-acceptable acid addition salt thereof, in association with a significant amount of a pharmaceutical carrier or coating.

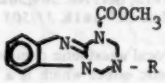
3,966,932

TRIAZINO-BEZIMIDAZOLE FUNGICIDES

Hans Röchling, Altenhain, Taunus, and Kurt Härtel, Hofheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 361,073, May 14, 1973, Pat. No. 3,896,120. This application Dec. 26, 1974, Ser. No. 536,399
Claims priority, application Germany, May 18, 1972, 2224244; Feb. 19, 1973, 2308067
Int. Cl.² A01N *9/22*
U.S. Cl. 424—249 6 Claims

1. A fungicidal composition which comprises an effective amount of a triazino-benzimidazole of the formula



in which R is alkyl having from 1 to 18 carbon atoms; alkenyl having from 3 to 18 carbon atoms, alkinyl having from 2 to 8 carbon atoms, cycloalkyl having from 3 to 12 carbon atoms, optionally substituted by one or more alkyl groups having from 1 to 4 carbon atoms or by hydroxy; cyclohexylalkyl, cyclohexylalkenyl, or cyclohexylalkinyl each having from 1 to 3 carbon atoms in the chain, endomethylene-cyclohexylmethyl, endomethylene-cyclohexenylmethyl, tricyclodecyl, or tricyclodecenyl; phenalkyl, diphenylalkyl or triphenylalkyl each having from 1 to 6 carbon atoms in the alkylene radical, the phenyl nuclei of which being optionally substituted by halogen, alkyl, alkoxy or alkylthio, each having from 1 to 4 carbon atoms or by di-(C_1-C_4)-alkylamino; phenyl or naphthyl, optionally being substituted by alkyl of from 1 to 4 carbon atoms, halogen, halogenoalkyl of from 1 to 4 carbon atoms, trifluoromethyl, hydroxy, alkoxy of from 1 to 4 carbon atoms, phenoxy or (C_1-C_4)-alkylthio; di-(C_1-C_4)-alkyl-amino-(C_2-C_6)-alkyl; hydroxy-(C_2-C_{18})-alkyl, (C_2-C_{18})-alkoxyalkyl or dialkoxyalkyl, (C_2-C_{18})-alkylmercaptoalkyl, (C_2-C_6)-dialkylphosphinyl-alkyl, furfuryl, morpholino-(C_1-C_4)-alkyl, pyrrolidino-(C_1-C_4)-alkyl, piperidino-(C_1-C_4)-alkyl or (C_2-C_{18})-carbalkoxylalkyl in admixture with an inert carrier, and a dispersing agent.

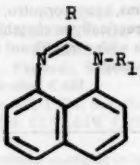
3,966,933

INHIBITION OF GASTRIC ACID SECRETION WITH 1-ALKYL-2-R-PERIMIDINES

Vasken Paragamian, Dresher, Pa., and Russell J. Taylor, Jr., Palmyra, N.J., assignors to NcNeil Laboratories, Incorporated, Fort Washington, Pa.

Continuation-in-part of Ser. No. 417,666, Nov. 20, 1973, abandoned. This application Dec. 12, 1974, Ser. No. 532,150
Int. Cl.² A61K *31/505*
U.S. Cl. 424—251 6 Claims

1. A method of inhibiting gastric acid secretion in a gastric hyperacidic subject which comprises internally administering thereto an effective gastric acid secretion inhibiting amount of a member selected from the group consisting of a disubstituted perimidine of the formula:



wherein R is a member selected from the group consisting of loweralkoxyloweralkyl and loweralkanoyloxyloweralkyl, and R_1 is loweralkyl, and a pharmaceutically acceptable acid addition salt thereof.

3,966,934

SYNERGISTIC LOCAL ANESTHETIC COMPOSITIONS

Herbert J. F. Adams, Westboro, and Bertil H. Takman, Worcester, both of Mass., assignors to Astra Pharmaceutical Products, Inc., Worcester, Mass.

Continuation-in-part of Ser. No. 206,181, Dec. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 109,942, Jan. 26, 1971, abandoned. This application June 12, 1973, Ser. No. 369,302

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 25 Claims

1. An injectable local anesthetic composition having long-lasting local anesthetic effect which is a solution consisting essentially of a pharmaceutically acceptable carrier having dissolved therein

a. a non-heterocyclic aminoacyl anilide local anesthetic compound in a concentration of from 0.05 to 5 percent by weight of the carrier and

b. a toxin selected from the group consisting of from 0.5 to 10 micrograms of tetrodotoxin per milliliter of the carrier and from 10 to 20 micrograms of desoxytetrodotoxin per milliliter of the carrier.

3,966,935

INHIBITION OF ULCERS WITH 2(3H)-PERIMIDYLIDENE-2-PROPANONE

Vasken Paragamian, Dresher, Pa., and Russell J. Taylor, Jr., Palmyra, N.J., assignors to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Continuation-in-part of Ser. No. 417,706, Nov. 20, 1973, abandoned. This application Dec. 12, 1974, Ser. No. 532,281

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 2 Claims

1. A method of aiding the prevention and amelioration of stomach ulcers which comprises internally administering to a subject having stomach ulcers an effective stomach ulcer-inhibiting amount of a member selected from the group consisting of 2(3H)-perimidylidene-2-propanone and a pharmaceutically acceptable acid addition salt thereof.

3,966,936

PIPERAZINO QUINAZOLINE BRONCHODILATORS

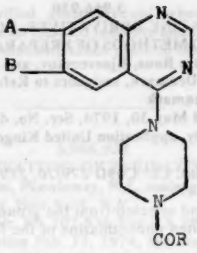
Timothy H. Cronin, Niantic, and Hans-Jürgen E. Hess, Old Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 444,669, Feb. 21, 1974, Pat. No. 3,914,423, which is a division of Ser. No. 315,617, Dec. 15, 1972, Pat. No. 3,814,760, which is a division of Ser. No. 55,964, July 17, 1970, Pat. No. 3,723,434. This application May 29, 1975, Ser. No. 581,830

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 3 Claims

1. A method for effecting bronchodilator action in a subject afflicted with bronchoconstriction, which comprises administering to said subject an effective amount of a compound selected from the group consisting of 4-piperazino-6,7-dialkoxyquinazoline bases of the formula:



and the pharmaceutically acceptable addition salts thereof, wherein A and B are each a member selected from the group consisting of methoxy and ethoxy, and R is a member selected from the group consisting of piperidino, hydroxypiperidino and 4-methyl-4-hydroxypiperidino.

3,966,937

METHOD FOR PROTECTING PLANTS FROM SOIL-BORNE PLANT DISEASE ORGANISMS USING METHYL-(4-METHYLPHENYL)-SUBSTITUTED-TETRAZOLO (1,5-a)-PYRIMIDINES

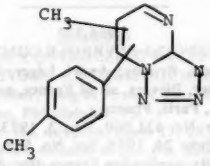
Fred Y. Edamura, Concord, and Ronald J. Sbragia, Clayton, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 451,668, March 14, 1974, Pat. No. 3,920,654. This application Jan. 20, 1975, Ser. No. 542,481

Int. Cl.² A01N *9/22*

U.S. Cl. 424—251 8 Claims

1. A composition useful for systemically protecting plants from diseases caused by soil-borne plant disease organisms comprising from about 2 to 98 percent by weight of the total composition of a methyl-(4-methylphenyl)-substituted tetrazolo(1,5-a)pyrimidine compound having the general formula:



wherein the methyl substituent is in the 5(or 7)- position and the 4-methylphenyl substituent is in the 7(or 5)- position, in combination with an inert solid or liquid carrier therefor, the said compound being the product of a process comprising the steps of (1) forming a reaction mixture containing a sodium 1-(4-methylphenyl)-1,3-butanedione intermediate by the reaction of about two molar proportions of each of p-methylacetophenone and sodium metal in the presence of ethylacetate, said reaction being carried out at a temperature below about 40°C, (2) reacting said reaction mixture of step (1) with about 2 molar proportions of 5-aminotetrazole monohydrate in the presence of a carrier medium under reflux conditions for from about 2 to about 6 hours to form a reaction mixture containing a methyl-(4-methylphenyl)-substituted 4,5-dihydrotetrazole(1,5-a)pyrimidin-5-ol intermediate, (3) recovering said intermediate formed in step (2), (4) dissolving the intermediate recovered in step (3) in a suitable carrier medium, and (5) treating said intermediate solution of step (4) with a concentrated acid at a temperature below about 30°C, thereby dehydrating said intermediate to the

methyl-(4-methylphenyl)-substituted tetrazolo(1,5-a)pyrimidine compound.

3,966,938

TREATMENT OF THROMBOSIS AND THE INHIBITION OF BLOOD PLATELET AGGREGATION

Hans Ott, Pfeffingen, and Rudolf Suess, Bettingen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

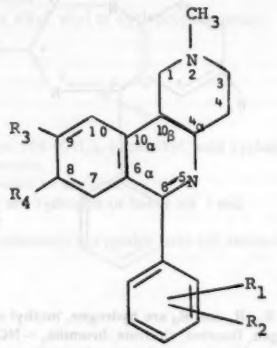
Division of Ser. No. 408,053, Oct. 19, 1973, Pat. No. 3,899,494, which is a continuation-in-part of Ser. No. 305,289, Nov. 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 303,069, Nov. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 140,239, May 4, 1971, abandoned. This application May 8, 1975, Ser. No. 575,523

Claims priority, application Switzerland, Oct. 26, 1972, 15675/72; Oct. 26, 1972, 15676/72; Oct. 26, 1972, 15677/72; Oct. 26, 1972, 15678/72

Int. Cl.[2] A61K *31/47*

U.S. Cl. 424—258 **20 Claims**

1. A method of treating thrombosis in animals, which comprises orally administering to an animal in need of such treatment a therapeutically effective amount of a compound of formula:



wherein

R_1 is hydrogen, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms or alkylthio of 1 to 3 carbon atoms, fluorine, bromine, chlorine, nitro, trifluoromethyl, amino or —NH—CO—R,

wherein

—CO—R is alkanoyl of 1 to 18 carbon atoms, benzoyl, benzoyl wherein the benzene ring is substituted by one X and one Y, X being lower alkyl of 1 to 4 carbon atoms, lower alkoxy of 1 to 4 carbon atoms, fluorine, chlorine, or bromine, and Y being hydrogen, lower alkyl of 1 to 4 carbon atoms, lower alkoxy of 1 to 4 carbon atoms, or chlorine, phenylalkenoyl wherein the akylene section has 1 to 3 carbon atoms, cinnamoyl, phenylalkenoyl as defined above or cinnamoyl which are substituted in the benzene ring by one X and one Y which are as defined above, or A-CO-, A being thienyl, furyl, pyrrolyl, or pyridyl,

R_2 is hydrogen, chlorine, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbon atoms, and

R_3 and R_4 are both hydrogen or both methoxy, or

R_3 and R_4 together are methylenedioxy,

or a pharmaceutically acceptable acid addition salt thereof.

3,966,939

NOVEL 2-SUBSTITUTED 6,7-BENZOMORPHAN DERIVATIVES AND SALTS THEREOF IN ANALGESIC COMPOSITIONS

Kenji Kobayashi, Takarazuka; Toshitsugu Fukumaru, Kyoto; Hiroyuki Mizote; Shigeho Inaba, both of Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

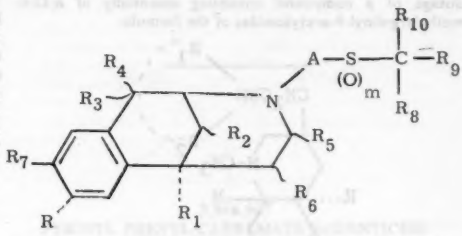
Division of Ser. No. 418,052, Nov. 21, 1973, Pat. No. 3,903,093. This application Mar. 17, 1975, Ser. No. 558,655

Claims priority, application Japan, Nov. 22, 1972, 47-117379

Int. Cl.[2] A61K *31/485*

U.S. Cl. 424—260 **15 Claims**

1. An analgesic composition comprising an analgesically effective amount of the 6,7-benzomorphan derivative of the formula:



wherein R is a hydrogen atom, a hydroxyl group, a C_1-C_3 alkoxy group or a C_1-C_8 alkanoyloxy group; R_1 is a hydrogen atom, a C_1-C_8 alkyl group, a C_3-C_{10} alkoxyalkyl group, a phenyl group a halophenyl group, an alkylphenyl group wherein the alkyl moiety has 1 to 3 carbon atoms or an alkoxyphenyl group wherein the alkoxy moiety has 1 to 3 carbon atoms; R_3 is a hydrogen atom or a hydroxyl group; R_4 is a hydrogen atom, a C_1-C_3 alkyl group, a phenyl group, a halophenyl group, an alkylphenyl group wherein the alkyl moiety has 1 to 3 carbon atoms or an alkoxyphenyl group wherein the alkoxy moiety has 1 to 3 carbon atoms, or R_3 and R_4 may form a C_1-C_3 alkylidene group or a carbonyl group together with the carbon atom to which they are bonded; R_2, R_5, R_6, R_7, R_8, R_9 and R_{10} are each a hydrogen atom or a C_1-C_3 alkyl group; A is a C_1-C_3 alkylene group; and m is an integer of 0 to 2 or an acid addition salt thereof as the active ingredient and a pharmaceutically acceptble carrier or diluent.

3,966,940

ANALGETIC COMPOSITIONS

Irwin J. Pachter, Fayetteville, and Maxwell Gordon, Syracuse, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation of Ser. No. 414,567, Nov. 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 60,621, Aug. 3, 1970, Pat. No. 3,773,955. This application Sept. 2, 1975, Ser. No. 609,847

Int. Cl.[2] A61K *31/485*

U.S. Cl. 424—260 **4 Claims**

1. A method for the treatment of a narcotic-addicted subject which comprises orally administering to said subject an effective amount of a composition consisting essentially of (a) a narcotic selected from the group consisting of α-dl-methadol, β-dl-methadol, α-l-methadol, β-dl-acetylmethadol, α-l-acetylmethadol and β-l-acetylmethadol in an amount sufficient to substantially prevent narcotic craving and (b) naloxone in an amount sufficient to induce withdrawal symptoms when said composition is administered parenterally but

insufficient to negate the action of said methadone when the composition is administered orally.

3,966,941

COMPOSITION FOR PREVENTING LACTATION OR PREGNANCY IN MAMMALS AND THE METHOD FOR USING THE SAME

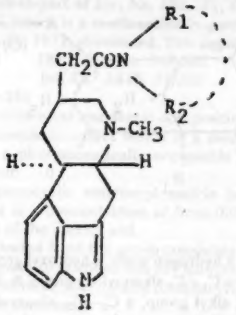
Miroslav Semonsky; Karel Rezabek, and Miroslav Seda, all of Prague, Czechoslovakia, assignors to Spofa United Pharmaceutical Works, Prague, Czechoslovakia

Continuation of Ser. No. 74,906, Sept. 23, 1970, abandoned. This application Dec. 18, 1972, Ser. No. 315,838

Int. Cl.² A61K *31/48*; C07D *457/02*

U.S. Cl. 424—261 9 Claims

1. A pharmaceutical composition for preventing lactation or pregnancy in mamals comprising "an admixture with a suitable pharmaceutical carrier" a therapeutically effective dosage of a compound consisting essentially of α-D-6-methylergolinyl-8-acetylamides of the formula:



wherein R_1 is hydrogen or alkyl having 1 to 6 carbon atoms, R_2 is hydrogen, alkyl having 1 to 6 carbon atoms, cycloalkyl having 5 or 6 carbon atoms, hydroxylkyl having 3 or 4 carbon atoms or alkoxycarbonylmethyl having an alkoxy group of 1 to 4 carbon atoms, or R_1 and R_2 jointly are divalent alkylene having 4 or 5 carbon atoms and pharmaceutically acceptable acid addition salts thereof.

3,966,942

3-SUBSTITUTED-5-HYDROXY(MERCAPTO)ALKYLIDENE-RHODANINE DERIVATIVES

Arthur Magnani, Wynnewood, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 379,037, July 13, 1973, Pat. No. 3,890,331, which is a continuation-in-part of Ser. No. 254,363, May 18, 1972, abandoned. This application Mar. 14, 1975, Ser. No. 558,399

Claims priority, application United Kingdom, May 3, 1973, 21064/73

Int. Cl.² A61K *31/44*, *31/425*

U.S. Cl. 424—263 9 Claims

1. A pharmaceutical composition having anti-arthritic activity, in dosage unit form, comprising a pharmaceutical carrier and an effective, nontoxic amount of a compound of the formula: v,

wherein:

R is lower alkyl of from 1 to 4 carbon atoms, straight or branched chain, cycloalkyl of from 3 to 6 carbon atoms, alkenyl of from 3 to 5 carbon atoms, phenyl, phenylalkyl of from 7 to 9 carbon atoms, monohalophenyl, dichlorophenyl, tolyl, methylchlorophenyl or pyridylmethyl;

R_1 is lower alkyl of from 1 to 4 carbon atoms, phenylalkyl of from 7 to 9 carbon atoms, said alkyl moieties being straight or branched chain, monochlorobenzyl or monomethylbenzyl; and

Y is oxygen or sulfur, or a 2-aminopyridine or 2-aminothiazole salt thereof.

3,966,943

6-PYRIDYL BENZODIAZEPINES ANTIDEPRESSANTS

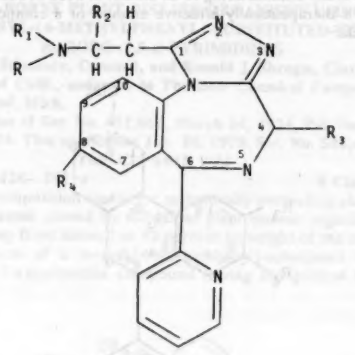
Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 180,111, Sept. 13, 1971, Pat. No. 3,767,661. This application Apr. 28, 1975, Ser. No. 572,140

Int. Cl.² A61K *31/44*

U.S. Cl. 424—263 9 Claims

1. A process for treating depression comprising the administration to a human or animal subject an effective antidepressant amount of a compound of the formula:



wherein R, R_1, R_2 and R_3 are hydrogen, methyl or ethyl, and R_4 is hydrogen, fluorine, chlorine, bromine, $—NO_2$, $—CF_3$, or methylthio, inclusive; or a pharmacologically acceptable acid addition salt thereof, in association with a pharmaceutical carrier.

3,966,944

10 (N-METHYL-4-PIPERIDYLIDENE)-10H[1]-BENZOPYRANO[3,2-b]-PYRIDINE AS AN ANALGESIC, ANTI-INFLAMMATORY AND AGENT AGAINST TYPE III HYPERSENSITIVITY DISEASE

George W. Carter, Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed May 19, 1975, Ser. No. 578,583

Int. Cl.² A61K *31/44*

U.S. Cl. 424—263 2 Claims

1. The method of treating analgesia inflammation and Type III hypersensitivity disease in a mammalian patient in need of such treatment comprising administering to said patient a therapeutically effective amount of 10 (N-methyl-4-piperidylidene)-10H[1]-benzopyrano[3,2-b]-pyridine.

3,966,945
2-ALKOXY(AND 2-ALKOXYALKYL)-2-HETEROCYCLIC-THIOACETAMIDES FOR INHIBITING GASTRIC ACID SECRETION

Helene E. Bowman Van Hoeven, Wallingford; L. Martin Brenner, Upper Darby, and Bernard Loev, Broomall, all of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

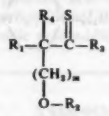
Division of Ser. No. 386,898, Aug. 9, 1973, Pat. No. 3,907,814, which is a continuation-in-part of Ser. No. 284,375, Aug. 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 248,512, April 28, 1972, abandoned. This application June 12, 1975, Ser. No. 586,314

Int. Cl.² A61K *31/44*

U.S. Cl. 424—263 12 Claims

1. A pharmaceutical composition having gastric acid secretion inhibitory activity, in dosage unit form, comprising a pharmaceutical carrier and an effective amount of a thioamide compound of the formula:

FORMULA I



in which:

m is 0, 1, or 2;

R_1 is 2-pyridyl

R_2 is lower alkyl, allyl or cyclopropanemethyl;

R_3 is

NH-phenyl or NH-$(CH_2)_n$-cycloalkyl, said cycloalkyl having 3-6 carbon atoms;

R_4 is hydrogen or lower alkyl;

R_5 and R_6 are hydrogen or lower alkyl and

n is 0 or 1

or a pharmaceutically acceptable acid salt thereof.

3,966,946
1,4-DIHYDROPYRIDINE COMPOUNDS IN TREATING HYPERTENSION

Anthony Maitland Roe, Hatfield; Robert Antony Slater, Letchworth, both of England, and Bernard Loev, Broomall, Pa., assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

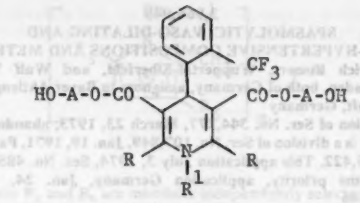
Continuation-in-part of Ser. No. 476,346, June 5, 1974, Pat. No. 3,910,937. This application July 8, 1975, Ser. No. 594,188

Claims priority, application United Kingdom, June 12, 1973, 27793/73

Int. Cl.² A61K *31/44*

U.S. Cl. 424—263 10 Claims

1. A pharmaceutical composition having anti-hypertensive activity, in dosage unit form, comprising a pharmaceutical carrier and in an effective amount to produce said activity a 1,4-dihydropyridine compound of the formula:



wherein R is lower alkyl, R^1 is hydrogen or methyl and A is a straight or branched alkylene chain the backbone of which contains from 2 to 4 carbon atoms.

3,966,947
PYRIDYL PHENYL-CARBAMATE RODENTICIDE

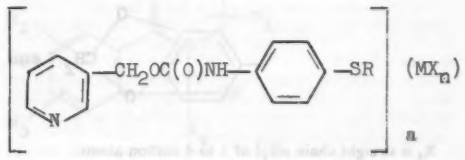
Edward E. Kilbourn, Chalfont, and Ernest D. Weiler, Ambler, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 429,464, Dec. 28, 1973, Pat. No. 3,929,808. This application Oct. 3, 1975, Ser. No. 619,278

Int. Cl.² A01N *9/22*

U.S. Cl. 424—263 8 Claims

1. A metal salt complex having the structure



wherein

R is

a. hydrogen

b. alkyl of 1 to 5 carbon atoms

c. allyl

d. CN

e. CCl_3 and

f. 5-tetrazolyl

M is a metal cation,

X is an anion forming a compound with the cation M in which the compound has sufficient solubility to form a metal salt complex, and

a is an integer corresponding to the valence of cation M and

n is an integer which for the anion X satisfied the valence of the cation M.

3,966,948

SPASMOLYTIC, VASO-DILATING AND ANTI-HYPERTENSIVE COMPOSITIONS AND METHODS

Friedrich Bossert, Wuppertal-Elberfeld, and Wulf Vater, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

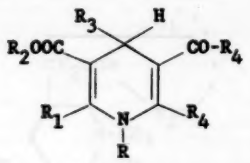
Division of Ser. No. 344,277, March 23, 1973, abandoned, which is a division of Ser. No. 107,849, Jan. 19, 1971, Pat. No. 3,775,422. This application July 3, 1974, Ser. No. 485,333

Claims priority, application Germany, Jan. 24, 1970, 2003146

Int. Cl.² A61K *31/455*

U.S. Cl. 424—266 41 Claims

1. A pharmaceutical composition capable of producing spasmolytic, vascular dilating, and antihypertensive effects upon administration to a human or other animal which comprises an effective amount of a 1,4-dihydropyridine of the formula:



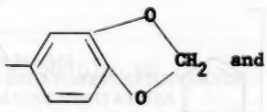
wherein

R is hydrogen or straight chain lower alkyl;

R_1 is straight or branched chain alkyl of 1 to 4 carbon atoms;

R_2 is straight or branched chain alkyl of 1 to 6 carbon atoms, straight or branched chain alkyl of 2 to 6 carbon atoms interrupted by 1 oxygen atom, furfuryl or propargyl;

R_3 is phenyl, benzyl or phenyl substituted by a member selected from the group consisting of nitro, cyano, halogen, trifluoromethyl, nitro and chloro, 1 or 2 alkoxy moieties of 1 to 2 carbon atoms, and a dioxymethylene moiety of the formula:



and

R_4 is straight chain alkyl of 1 to 4 carbon atoms.

3,966,949

PHARMACEUTICAL COMPOSITIONS AND PREPARING SAME

Norval Ellsworth Webb, Jr., Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed Oct. 12, 1973, Ser. No. 406,013

Int. Cl.² A61K *31/135*, *31/445*, *31/425*, *31/535*

U.S. Cl. 424—250 10 Claims

1. A method of preparing a stabilized aqueous parenteral composition of a water-insoluble therapeutic agent containing a tertiary amine capable of being protonated which comprises reacting said therapeutic agent with at least a stabilizing amount of a lipophilic liquid fatty acid having from 14 to 24 carbon atoms to form a lipophilic, fatty acid liquid salt; incorporating a nonionic surfactant with said liquid salt; and incorporating water to effect a solution suitable for injection.

3,966,950

NOVEL THERAPEUTIC COMPOSITIONS AND METHOD INVOLVING THIAZOL-CARBOXAMIDES

Odile Le Martret, Paris, and Francois Clemence, Rosny-sous-Bois, both of France, assignors to Roussel-UCLAF, Paris, France

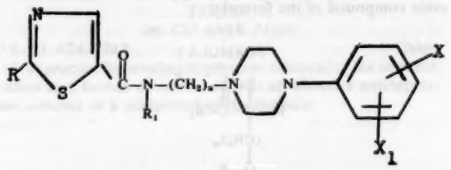
Division of Ser. No. 340,289, March 12, 1973, Pat. No. 3,872,124. This application Jan. 8, 1975, Ser. No. 539,327

Claims priority, application France, Mar. 22, 1972, 72.10010

Int. Cl.² A61K *31/495*

U.S. Cl. 424—250 9 Claims

1. An α-adrenolytic composition comprising an effective amount of a compound selected from the group consisting of thiazolcarboxamides of the formula



wherein R is selected from the group consisting of alkyl of 1 to 6 carbon atoms and phenyl, R_1 is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, n is a whole number from 2 to 5 and X and X_1 are individually selected from the group consisting of hydrogen, halogen, trifluoromethyl and alkyl, alkoxy and alkylthio of 1 to 4 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts and a pharmaceutical carrier.

3,966,951

ESTERS OF QUINOXALINE-1,4-DIOXIDES

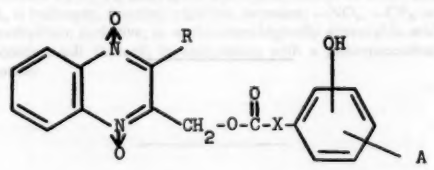
Banavara L. Mylari, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Apr. 2, 1975, Ser. No. 564,363

Int. Cl.² A61K *31/495*; C07D *241/36*

U.S. Cl. 424—250 17 Claims

1. A compound of the structure



wherein

X is selected from the group consisting of a single bond, n-alkylene having up to six carbon atoms and $-(CH_2)_p-CH=CH-(CH_2)_q-$ wherein p and q have integral values from zero to four with the proviso that p plus q is less than or equal to four;

A is selected from the group consisting of hydrogen, hydroxyl, lower alkyl, lower alkoxy, fluorine, chlorine, bromine, iodine, cyano and trifluoromethyl; and

R is selected from the group consisting of hydrogen lower alkanoyl and α-hydroxy lower alkyl.

8. A method of promoting growth and improving feed efficiency of animals comprising administering to said animals a pharmaceutically effective amount of a compound of claim 1.

10. A method of controlling bacterial infections in animals caused by susceptible microorganism comprising administer-

ing to said animals a pharmaceutically effective amount of a compound of claim 1.

3,966,952

ALPHA-ISOMER OF THE PALMITIC ACID ESTER OF 10-[3-(4-HYDROXYETHYL-1-PIPERAZINYL)-PROPYLIDENE]-2-TRIFLUOROMETHYL THIAXANTHENE, COMPOSITIONS THEREOF AND A METHOD OF PREPARATON THEREOF AND USE THEREOF

Jorn Lasse Martin Buus, Bjaeverskov, Denmark, assignor to Kefalas A/S, Copenhagen-Valby, Denmark

Filed Dec. 4, 1974, Ser. No. 529,281

Claims priority, application United Kingdom, Dec. 7, 1973, 56900/73

Int. Cl.² A61K *31/493*

U.S. Cl. 424—250 **10 Claims**

1. A compound selected from the group consisting of 1) the alpha-isomer of the palmitic acid ester of 10-[3-(4-hydroxyethyl-1-piperazinyl)propylidene]-2-trifluoromethyl thioxanthene and 2) a non-toxic acid addition salt thereof.

3,966,953

2-(CARBAMOYLOXIMINO)-4-THIAZOLIDINONE COMPOUNDS AS INSECTICIDAL, MITICIDAL OR NEMATOCIDAL AGENTS

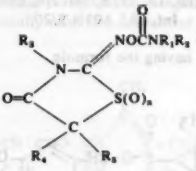
Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,761

Int. Cl.² A01N *9/12, 9/20*

U.S. Cl. 424—270 **20 Claims**

1. An insecticidal, miticidal or nematocidal composition comprising an acceptable carrier and an insecticidal, miticidal or nematocidal amount of a compound of the formula:



wherein:

R_1 is trihalomethanesulfenyl, R_2 is hydrogen or lower alkyl;

R_3 is hydrogen, lower alkyl, halo substituted lower alkyl, lower alkenyl, lower dialkylamino, lower alkoxy lower alkyl or lower alkylthio lower alkyl;

R_4 and R_5 are individually hydrogen, lower alkyl, lower alkoxy lower alkyl or lower alkylthio lower akyl; and

n is 0, 1 or 2.

3,966,954

3,5-CYCLOALKYL PYRAZOLIUM SALTS AS FUNGICIDES

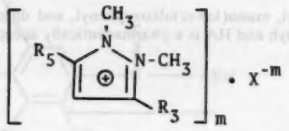
Bryant Leonidas Walworth, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 399,785, Sept. 21, 1973, Pat. No. 3,907,825. This application Mar. 17, 1975, Ser. No. 559,000

Int. Cl.² A01N *9/22*

U.S. Cl. 424—273 **14 Claims**

1. A method for controlling disease growth and protecting plants from attack by plant pathogenic fungi comprising, applying to said plants which are to be protected a fungicidally effective amount of a compound having the formula:



wherein R_3 and R_5 are members independently selected from the group consisting of alkyl C_4–C_{11}, phenyl, cycloalkyl C_5–C_7, and halogen provided that:

a. when one of R_3 and R_5 is alkyl C_4–C_{11}, the other R group is phenyl; or

b. when one of R_3 and R_5 is cycloalkyl C_5–C_7, the other R group is cycloalkyl C_5–C_7 or halogen; or

c. when one of R_3 and R_5 is phenyl, th other R group is alkyl C_4–C_{11}, cycloalkyl C_5–C_7 or halogen; or

d. when one of R_3 and R_5 is halogen, the other group is phenyl or cycloalkyl C_5–C_7; X represents an anion having a charge of from 1 to 3 and is selected from the group consisting of bromide, chloride, iodide, acetate, sulfate, hydrogen sulfate, methyl sulfate, benzene sulfonate, p-toluene sulfonate, nitrate, phosphate, carbonate, perchlorate and mixed sulfate/hydrogen sulfate; m is an integer selected from 1, 2 and 3.

3,966,955

ANTI-ULCER THERAPY

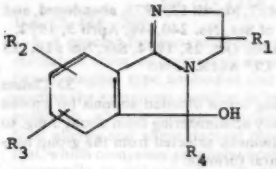
David A. Shriver, King of Prussia, and Melvyn I. Gluckman, Wayne, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Aug. 7, 1974, Ser. No. 495,353

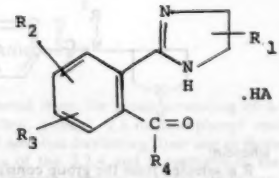
Int. Cl.² A61K *31/415*

U.S. Cl. 424—273 **1 Claim**

1. The method of treating gastric ulcers in a warm blooded animal suffering from ulcers which comprises orally or parenterally administering to said animal an effective amount of a compound of the following formulae:



and



wherein

R_1 is hydrogen or lower alkyl;

R_2 is selected from the group consisting of hydrogen, halogen, amino, lower alkylamino, lower alkyl, and lower alkoxy; R_3 is hydrogen when R_2 and R_3 are dissimilar and when R_2 and R_3 are the same they are both selected from the group consisting of hydrogen, halogen, lower alkyl, and lower alkoxy; R_4 is selected from the group consisting of phenyl, monohalophenyl, dihalophenyl, mono(lower-)alkylphenyl, di(lower)alkyl-phenyl, trifluoromethyl-

phenyl, mono(lower)alkoxyphenyl, and di(lower)alkoxyphenyl; and HA is a pharmaceutically acceptable acid.

3,966,956

[1-(p-CHLOROBENZOYL)-5-METHOXY-2-METHYL-3-INDOLE]ACETOXYACETIC ACID AND SALTS IN TREATING INFLAMMATION

Karl-Heinz Boltze, Bensberg-Kippekausen; Otfried Brendler, Cologne; Hans-Dieter Dell, Bergisch-Gladbach, and Hairedin Jacobi, Leichlingen, all of Germany, assignors to Troponwerke Dinklage & Company, Cologne, Germany

Division of Ser. No. 374,615, June 28, 1973, Pat. No. 3,910,952. This application Apr. 9, 1975, Ser. No. 566,452

Claims priority, application Germany, July 14, 1972, 2234651

Int. Cl.[2] A61K *31/40*

U.S. Cl. 424—274 **9 Claims**

7. Method of treating inflammation which comprises administering to a subject in need thereof a therapeutically effective amount of [1-(p-chlorobenzoyl)-5-methoxy-2-methyl-3-indole]-acetoxyacetic acid or a pharmacologically acceptable salt thereof.

3,966,957

METHOD FOR CONTROLLING EMESIS WITH N-(1-SUBSTITUTED-3-PYRROLIDINYL)BENZAMIDES AND THIOBENZAMIDES

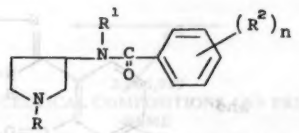
Albert Duncan Cale, Jr., Mechanicsville, and Charles Arthur Leonard, Richmond, both of Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 340,417, March 12, 1973, abandoned, and a continuation-in-part of Ser. No. 240,840, April 3, 1972, abandoned. This application Oct. 25, 1974, Ser. No. 518,123

Int. Cl.[2] A61K *31/40*

U.S. Cl. 424—274 **33 Claims**

1. A method of treating warm blooded animals for emesis which comprises internally administering from about 5 mg. to about 100 mg. of an antiemetic selected from the group having the following structural formula:



wherein;

R is selected from the group consisting of cycloalkyl of 4 to 12 carbon atoms, phenyl, benzyl and phenethyl,

R^1 is selected from the group consisting of hydrogen, lower alkyl of 1 to 8 carbon atoms and phenyl,

R^2 is selected from the group consisting of halogen, loweralkyl of 1 to 8 carbon atoms, methoxy, ethoxy, amino, nitro, dimethylamino, methylamino, mercaptomethyl, acetamido, sulfamoyl, cyano, hydroxy, benzyloxy and trifluoromethyl,

n is an integer from zero to three inclusive, and

the pharmaceutically acceptable acid addition salts thereof.

3,966,958

METHODS AND COMPOSITIONS FOR INCREASING FEED INTAKE OF ANIMALS

Clifton A. Baile, Glen Mills; Gregory Gallagher, Collegeville; Carol Lynn McLaughlin, Malvern, and Robert Lee Webb, West Chester, all of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 328,235, Jan. 31, 1973, Pat. No. 3,852,473. This application July 26, 1974, Ser. No. 491,980

Int. Cl.[2] A61K *31/27*

U.S. Cl. 424—300 **7 Claims**

1. The method of increasing feed intake in healthy, immature sheep, pig or cattle subjects comprising administering orally or by implant to said subjects a quantity effective for increasing feed intake but nontoxic to the subject of an active ingredient having the formula:

RR'R''CX

in which:

R is lower alkyl of from 1–9 carbons or hydroxy lower alkyl of from 1–9 carbons;

R' is lower alkyl of from 1–9 carbons, fluoro, bromo or chloro;

R'' is lower alkyl of from 1–9 carbons, lower alkenyl of from 2–9 carbons, lower alkynyl of from 2–9 carbons and, when R and R' are lower alkyl or hydrogen, R'' is phenyl; and

X is $-NHCONH_2$, $-ONHCONH_2$, $-OCONH_2$ or $-CONHCONH_2$ said increase in feed intake resulting in a faster rate of weight gain.

3,966,959

INSECTICIDAL AND ACARICIDAL PYRETHROID COMPOUNDS

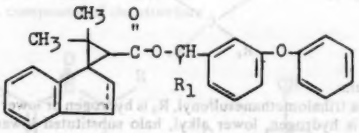
Roger Williams Addor, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 13, 1975, Ser. No. 550,105

Int. Cl.[2] A01N *9/20*

U.S. Cl. 424—304 **16 Claims**

1. A compound having the formula



(I)

wherein R_1 is hydrogen, cyano or ethynyl, and represents a single or double bond, and the optical and geometric isomers thereof.

3,966,960

3-(4-BIPHENYLCARBONYL)PROPIONIC ACID AS AN INHIBITOR OF PLATELET AGGREGATION

Leon Ellenbogen, New City, N.Y., and Constance Anne Kohler, Nutley, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 25, 1975, Ser. No. 571,826

Int. Cl.[2] A61K *31/19*

U.S. Cl. 424—317 **5 Claims**

1. A method of producing an inhibitory effect on blood platelet aggregation which comprises incorporating into the blood of a thrombotic warm-blooded animal an effective amount of 3-(4-biphenylcarbonyl)propionic acid or a pharmaceutically acceptable salt thereof.

3,966,961

METHANESULFONIC ACID-2-BROMOETHYL ESTER NEMATOCIDE

Denis Varsanyi, Arlesheim; Paul Rathgeb, Basel, and Karl Gass, Magden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 13, 1974, Ser. No. 532,432
Claims priority, application Switzerland, Dec. 21, 1973, 18055/73
Int. Cl.² A01N 9/14
U.S. Cl. 424—303 1 Claim

1. A method of combatting pests of the class Nematoda which comprises applying to said pest a nematocidally effective amount of 2-bromoethylmethane sulphonate.

3,966,962

TRIACETIN SOLUTIONS OF PGE-TYPE COMPOUNDS

Samuel H. Yalkowsky, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 27, 1975, Ser. No. 562,535
Int. Cl.² A61K 31/215, 31/19
U.S. Cl. 424—305 9 Claims

1. A stable dosage form of a prostaglandin-like compound of the PGE-type comprising a solution of said compound in triacetin.

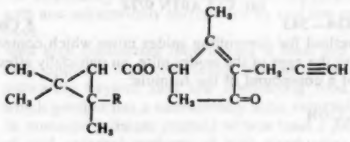
3,966,963

INSECTICIDAL COMPOSITION CONTAINING CYCLOPROPANE-CARBOXYLATE

Yoshitoshi Okuno, Toyonaka; Nobushige Itaya, Ikeda, and Toshio Mizutani, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 364,271, May 29, 1973, Pat. No. 3,876,681. This application Jan. 13, 1975, Ser. No. 540,547
Claims priority, application Japan, May 31, 1972, 47-54533
Int. Cl.² A01N 9/24
U.S. Cl. 424—305 3 Claims

1. An insecticidal composition comprising an inert carrier and an insecticidally effective amount of a compound of formula



(I)

wherein R is hydrogen or methyl group.

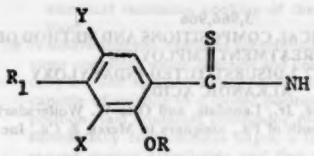
3,966,964

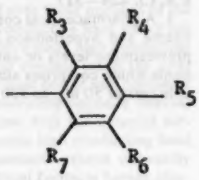
VETERINARY COMPOSITION CONTAINING THIONOSALICYLIC ACID ANILIDES OR SALTS THEREOF AND METHODS OF USING THE SAME

Jurgen Kurz, Wuppertal-Elberfeld; Heinrich Kolling, Hannover, Rhineland, and Manfred Federmann, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 861,158, Sept. 25, 1969, Pat. No. 3,898,272, which is a continuation-in-part of Ser. No. 634,835, May 1, 1967, abandoned. This application Feb. 13, 1975, Ser. No. 549,689
Claims priority, application Germany, May 6, 1966, 49138; Aug. 17, 1966, 49965; Sept. 3, 1966, 50110
Int. Cl.² A61K 31/235
U.S. Cl. 424—308 52 Claims

1. A veterinary composition having parasiticidal activity, which comprises a parasiticidally effective amount of a compound of the formula:





wherein

R is hydrogen, lower alkanoyl or phenyl lower alkanoyl,

R_1 is hydrogen or lower alkyl,

R_3, R_4, R_5, R_6 and R_7 are the same or different and are each hydrogen, lower alkyl, lower alkoxy, halogen, nitro, trifluoromethyl or lower alkylmercapto and

X and Y are the same or different, wherein X is halogen or nitro, and Y is hydrogen or halogen,

or a salt thereof with a non-toxic inorganic or organic base in combination with a non-toxic veterinary carrier.

3,966,965

OXAMIC ACID DERIVATIVES FOR THE PREVENTION OF IMMEDIATE TYPE HYPERSENSITIVITY REACTIONS

John H. Selistedt, Pottstown; Charles J. Guinosso, King of Prussia, and Albert J. Begany, Perkiomenville, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 344,466, March 23, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,465
Int. Cl.² A61K 31/24
U.S. Cl. 424—309 9 Claims

1. A process for preventing the release of pharmacological mediators from an immediate hypersensitivity reaction between reaginic type antibodies and an antigen, thereby preventing the symptoms manifest in bronchial asthma, seasonal pollinosis, allergic rhinitis, urticaria, allergic conjunctivitis, food allergy and anaphylactoid reactions of a sensitized animal, which comprises prophylactically administering, orally or prenterally, to said animal an effective amount of a compound of the formula:

in which

A is a member selected from the group consisting of α-naphthyl, β-naphthyl, phenyl, 2,6-dichlorophenyl and substituted phenyl moieties containing from one to three substituents in any of the 2,3,4 and 5 positions of the phenyl ring, independently selected from the group consisting of lower alkyl, lower alkylthio, lower alkylsulfinyl, lower alkoxy, hydroxy(lower)alkoxy, 2-(lower alkoxy oxalyloxy)ethoxy, benzyloxy, N-mono- and di-lower alkylamino(lower)alkoxy, halo, sulfamyl, polyhalo(lower-)alkyl, carbamyl, N-lower alkylcarbamyl, nitro, mono- and di- lower alkylamino, carboxy, lower alkylcarbonyl, carb(lower)alkoxy, phenoxy(lower)alkoxy, lower alkoxy oxalamido and lower alkoxyoxalamidophenoxy; and

B is lower alkoxy, cyclohexyloxy or phenoxy.

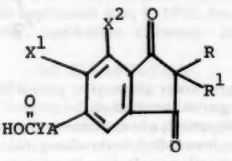
3,966,966

PHARMACEUTICAL COMPOSITIONS AND METHOD OF TREATMENT EMPLOYING 1,3-DIOXO-2,2-DISUBSTITUTED INDANYLOXY ALKANOIC ACIDS

Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 405,967, Oct. 12, 1973. This application July 31, 1974, Ser. No. 492,942
Int. Cl.² A61K 31/19
U.S. Cl. 424—317 4 Claims

1. A pharmaceutical composition useful in the treatment of edema and hypertension which also maintains uric acid at pretreatment levels or causes a decrease in uric acid in patients which comprises along with a pharmaceutically acceptable carrier 50 mg. to 500 mg. of a compound of the formula:



wherein

A is oxygen;

R is lower alkyl having from 1 to 5 carbon atoms, cycloalkyl, phenyl or substituted phenyl wherein the substituent is lower alkyl or halo,

R^1 is hydrogen, lower alkyl having 1 to 5 carbon atoms, lower alkenyl having 3 to 5 carbon atoms, lower alkynyl having from 3 to 5 carbon atoms, phenyl lower alkyl wherein lower alkyl has 1 to 3 carbon atoms, phenyl lower alkenyl wherein lower alkenyl has 2 to 5 carbon atoms, phenyl or substituted phenyl wherein the substituent is lower alkyl or halo;

X^1 is hydrogen, methyl or halo; and

X^2 is methyl or halo; and

Y is alkylene or haloalkylene containing a maximum of 4 carbon atoms, and

the racemic form, the enantiomers and the non-toxic, pharmacologically acceptable salt thereof.

3,966,967

COMPOSITIONS AND METHODS OF TREATING PSORIASIS WITH VINYLOGS OF DESMETHYL RETINOIC ACID

Kwan-Hua Lee, San Francisco, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 343,559, March 21, 1973, Pat. No. 3,882,244, and a continuation-in-part of Ser. No. 207,623, Dec. 13, 1971, abandoned. This application Oct. 29, 1974, Ser. No. 518,548
Int. Cl.² A61K 31/07
U.S. Cl. 424—318 2 Claims

1. A medicine for topical application to the body comprising a physiological acceptable carrier and from about 0.1 to 2% of 2, 6, 6,-Trimethyl-1-(10'-carboxy-deca-1',3',5',7',9'-pentaenyl) cyclohex-1-ene.

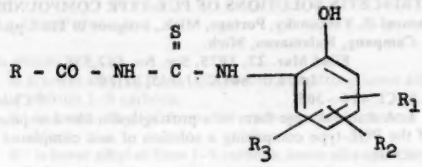
3,966,968

N,N'-DISUBSTITUTED THIOUREAS, THEIR PROCESS OF PRODUCTION AND USE AS ANTIMICROBIAL AGENTS

Hans Andree, Dusseldorf-Itter; Günther Koppensteiner, Melsungen, and Heinz-Ulrich Stracke, Langenfeld, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed Dec. 18, 1973, Ser. No. 425,800
Claims priority, application Germany, Jan. 26, 1973, 2303761
Int. Cl.² A01N 9/12
U.S. Cl. 424—322 14 Claims

1. In the method of controlling bacteria which comprises contacting bacteria with a bactericidal amount of a bactericide, the improvement consisting of utilizing a bactericidal amount of a N,N'-disubstituted thiourea of the formula



wherein R is a member selected from the group consisting of lower alkyl, phenyl, methoxyphenyl and nitrophenyl, and R_1, R_2 and R_3 are members selected from the group consisting of hydrogen, lower alkyl, chlorine, bromine and nitro.

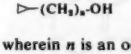
3,966,969

SPIDER MITE CONTROL

William E. Willy, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Mar. 6, 1975, Ser. No. 555,758
Int. Cl.² A01N 9/24
U.S. Cl. 424—343 5 Claims

1. A method for controlling spider mites which comprises applying to the eggs of the spider mite, an ovicidally effective amount of a compound of the formula:



wherein *n* is an odd integer from 7 to 15.

3,966,970

METHOD FOR PACKAGING A UNIQUE CHEESE ITEM

Murray John Williams, Syracuse, N.Y., assignor to Borden, Inc., Columbus, Ohio

Filed June 6, 1974, Ser. No. 477,015
Int. Cl.² A23C 11/14
U.S. Cl. 426—393 8 Claims

1. A method of making a packaged cheese product comprising preparing a molten cheese composition, cooling the molten cheese composition to a temperature of 40° to 60°F, extruding the cheese composition in the form of cheese rope which holds its shape, rapidly cooling the cheese rope to a temperature of 10° to 30°F, cutting the cheese rope into cheese pieces of about ¼ to 1½ inches in length following the cooling step, and wrapping each cheese piece in a suitable wrapping material on a high speed wrapping machine.

3,966,971
SEPARATION OF PROTEIN FROM VEGETABLE SOURCES

Alpha L. Morehouse, and Ronald C. Malzahn, both of Muscatine, Iowa, assignors to Grain Processing Corporation, Muscatine, Iowa

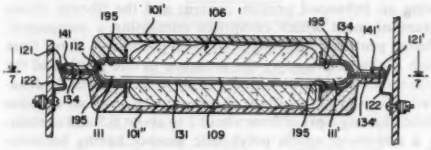
Filed Jan. 2, 1975, Ser. No. 538,127
Int. Cl.² A23L *1/20*
U.S. Cl. 426—44 **5 Claims**

1. A process of obtaining protein from a vegetable protein source material which comprises washing a vegetable protein source material with water maintained at a pH of minimum protein solubility, subjecting the washed vegetable protein source material to digestion in water at a pH of from about 2 to 6 in the presence of acid phytase, and separating a liquid extract containing soluble protein from the insoluble digestion residue.

3,966,972
PACKAGED COATED FOOD PRODUCT CAPABLE OF BEING COOKED USING ELECTRODES

Ernst Theodore Theimer, Rumson, and George E. Heinze, East Brunswick, both of N.J., assignors to Lectrofood, Inc., East Brunswick, N.J.

Filed Feb. 28, 1974, Ser. No. 446,822
Int. Cl.² B65B *25/22*; A23L *1/04*
U.S. Cl. 426—90 **15 Claims**



1. A packaged food, for cooking the food therein, wherein a container encloses an edible sandwich type food, said packaged food comprising:

a. An electrically low conducting food having high electrical resistivity;

b. An electrically high conducting food disposed in contact with and substantially surrounded by said low conducting food;

c. Said high conducting food having at least two diametrically opposite high conducting food portions extending outwardly beyond said low conducting food, each of which portion has a substantially solid external surface;

d. In common intimate contact with at least a part of each of said external surfaces of high conducting food; an electrically high conducting composition and at least two electrical contacts, said electrically high conducting composition forming a continuous phase and coated onto and being an integral part of each of said substantially solid external surfaces comprising a combination of:

i. a gel material selected from the group consisting of agar, xanthan gum, tragacanth, guar gum and gum arabic; and

ii. an edible non-toxic substantially ionized species selected from the group consisting of sodium chloride, potassium chloride, ammonium chloride, sodium iodide, potassium iodide, magnesium chloride, sodium glutamate, potassium glutamate, sodium alginate, potassium alginate, ammonium alginate, magnesium alginate, calcium alginate, sodium bicarbonate, potassium bicarbonate, magnesium bicarbonate, calcium bicarbonate, sodium nitrate, potassium nitrate, sodium nitrite and potassium nitrite;

said composition being positioned to make intimate contact between the electrical contacts and the substantially solid surface of said electrially high conducting food thereby acting to eliminate arcing during the electrical resistance cooking of the high conducting food;

e. A hollow thermal insulating substantially moisture impervious container which contains and encloses said electrically low and high conducting foods, said container being capable of existing in a closed position and in an open position, said container comprising two sections having substantially conterminous edges, a first section and a second section articulating said first section, said first section and said second section having mutually substantially continuous conterminous edges, at least one of said sections having an internal surface designed to fixedly hold said high conducting food over those portions of the external surfaces of said high conducting food which are in intimate contact with said electrically high conducting composition and said electrical contact when the container is in a closed position; at least one of said container sections has substantially diametrically opposite internal surfaces which are conterminous with the external surfaces of said diametrically opposite high conducting food portions; and the electrical contacts extend outwardly from said container, said electrical contacts having electrically conducting ends external to said container, said ends being designed to make the electrical contact with an electrical energy source when said container is in a closed position.

3,966,973
PROCESS FOR DETERMINING AND CONTROLLING THE MOISTURE OF FOOD PRODUCTS

William F. Henry, Minneapolis; Gareth J. Templeman, Chanhassen; Roger A. Gorman, Hopkins, all of Minn., and Lawrence Pinaire, Clarksville, Ind., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Aug. 26, 1974, Ser. No. 500,971
Int. Cl.² G01N *33/02*
U.S. Cl. 426—231 **5 Claims**

1. A process for determining the moisture content of a food comprising applying an alternating current to the food product, measuring the impedance in Ohms and the phase angle in degrees expressed from minus 90° to plus 90°, measuring the NMR liquid content and expressing the moisture content as a function of the applied frequency in Hertz, the phase angle in degrees, the impedance in Ohms, and the NMR liquid content.

3,966,974
CURING OF MEAT USING ORGANIC NITRITES

Kekhusroo R. Bharucha, Toronto; Charles K. Cross, Rexdale, and Leon J. Rubin, Toronto, all of Canada, assignors to Canada Packers Limited, Toronto, Canada

Continuation-in-part of Ser. No. 426,131, Dec. 19, 1973, abandoned. This application June 4, 1975, Ser. No. 583,798
Int. Cl.² A23L *1/272*, *1/31*; A23B *4/14*
U.S. Cl. 426—265 **22 Claims**

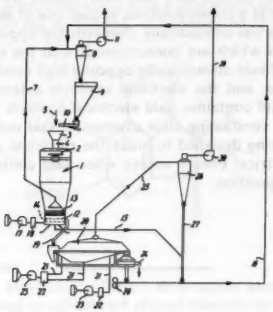
13. A method for the curing of meats comprising contacting the meat with a curing solution containing an organic nitrite of boiling point in the range of about 15° to 150°C, said organic nitrite being emulsified in said solution in an amount sufficient to provide a nitrite equivalent of a conventional alkali metal nitrite curing solution.

3,966,975

METHOD FOR PRODUCING AGGLOMERATED POWDERS AND APPARATUS FOR PERFORMING THE METHOD

Karl Erik Hansen, Copenhagen, and Ove Hansen, Vaerlose, both of Denmark, assignors to Aktieselskabet Niro Atomizer, Soborg, Denmark

Continuation-in-part of Ser. No. 206,710, Dec. 10, 1971, abandoned. This application July 19, 1973, Ser. No. 380,794
Claims priority, application United Kingdom, Dec. 21, 1970, 60700/70; Germany, Dec. 10, 1971, 2161448; Japan, Dec. 21, 1971, 46-103303
Int. Cl.² A23C 9/00
U.S. Cl. 426—285 26 Claims



1. A method for producing agglomerated hygroscopic soluble powder products of coffee or coffee substitutes from a powder of the raw materials, said method comprising the steps of:

a. dropping the raw materials
  i. in an unobstructed movement directly down towards a disc
  ii. a distance sufficient to permit moistening of the raw materials in the next-recited step;
b. moistening the raw materials
  i. with an aqueous moistening agent
  ii. as they drop towards the disc
  iii. by an amount sufficient to cause agglomeration of the raw materials; and
c. causing the disc to rotate with sufficient speed to cause the moistened raw materials to be thrown off the disc by centrifugal force, the disc being shaped so that the motion of the raw materials as they are thrown off the disc by centrifugal force is unobstructed.

14. Apparatus for producing agglomerated hygroscopic soluble powder products of coffee or coffee substitutes from a powder of the raw materials, said apparatus comprising:

a. a chamber;
b. means defining an inlet for the raw materials located in said chamber;
c. means for moistening the raw materials
  i. with an aqueous moistening agent
  ii. as they drop into said chamber from said inlet
  iii. by an amount sufficient to cause agglomeration of the raw materials;
d. a disc
  i. located vertically below said inlet by a distance sufficient to permit moistening of the raw materials as they fall in an unobstructed movement from said inlet
  ii. shaped so that the motion of the raw materials as they are thrown off the disc by centrifugal force is unobstructed;
e. means for rotating said disc with sufficient speed to cause the moistened raw materials to be thrown off said disc by centrifugal force; and
f. means for causing the raw materials to have a uniform distribution across the cross-section of the moistening zone.

3,966,976

FOAM STABLE MALT BEVERAGE

Harry R. Schuppner, Jr., El Cajon, and John H. Randel, San Diego, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 27, 1975, Ser. No. 581,387
Int. Cl.² A21D 4/00
U.S. Cl. 426—329 3 Claims

1. The method of improving the foam properties of fermented malt beverages which comprises adding to the beverage a quantity of between about 5 to 100 parts per million by the weight of said beverage of the Polysaccharide colloid S-10.

3,966,977

VEGETABLE PROTEIN PRODUCT AND PROCESS

Arthur A. Levinson, Chicago, and Kenneth B. Bassa, Evanston, both of Ill., assignors to National Can Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 60,764, Aug. 3, 1970. This application Oct. 10, 1973, Ser. No. 405,201
Int. Cl.² A23J 3/00; A23L 1/20, 3/34
U.S. Cl. 426—331 4 Claims

1. A process for producing a proteinaceous food product having an enhanced protein content and the fibrous chewy texture of meat which comprises contacting a compacted, defatted protein-containing seed meal product in shard form which is characterized by the presence as one portion of the surface thereof of a densified, tough, at least partially denatured skin which is resistant to rehydration; with an aqueous solution having a pH of from about 2 to about 6.5 and containing a non-toxic, edible polyhydric alcohol having bacteriostatic properties, at temperatures above about 105°C. and at superatmospheric pressure for a time sufficient to solubilize and extract a portion of the non-proteinaceous component of said starting material and increase the relative protein content thereof and render the starting material substantially porous, recovering the product from the resulting liquor and reducing the moisture content of the product to from about 12 to about 50% by weight; said product containing an amount of polyhydric alcohol sufficient to render it resistant to bacterial attack when packaged without sterilization or canning.

3,966,978

4-BIPHENYLACETIC ACID AS AN INHIBITOR OF PLATELET AGGREGATION

Leon Ellenbogen, New City, N.Y., and Constance Anne Kohler, Nutley, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 25, 1975, Ser. No. 571,815
Int. Cl.² A61K 31/19
U.S. Cl. 424—317 4 Claims

1. A method of producing an inhibitory effect on blood platelet aggregation which comprises incorporating into the blood of a thrombotic warm-blooded animal an effective amount of 4-biphenylacetic acid or a pharmaceutically acceptable salt thereof.

3,966,979

PROCESS FOR FREEZING COFFEE EXTRACT

Saul N. Katz, Monsey, N.Y., and Daniel E. Dwyer, Jr., Long Valley, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 21, 1975, Ser. No. 579,535
Int. Cl.² A23F 1/04; A23C 1/06
U.S. Cl. 426—385 10 Claims

1. A process for producing a dark colored freeze-dried coffee which comprises:

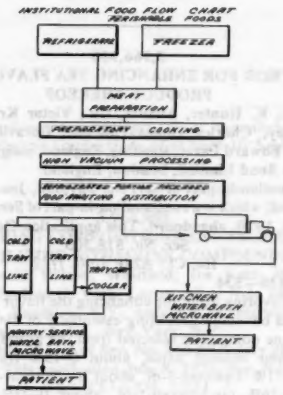
a. producing a liquid coffee extract,
b. continuously applying layers of said extract to a freezing surface which is sufficiently chilled to fast freeze the extract such that as the extract continues to be applied it contacts each previously frozen layer of extract and constantly remelts the upper portion of that layer,
c. completely freezing the extract,
d. comminuting the frozen extract, and
e. freeze-drying the frozen comminuted extract to a stable moisture content.

3,966,980

METHOD OF COOKING AND STORING FOOD IN FLEXIBLE BAGS

Ambrose T. McGuckian, Bethesda, Md., assignor to A.G.S. Food System Inc., Greenville, S.C.

Filed May 2, 1969, Ser. No. 821,181
Int. Cl.² B65B 25/22
U.S. Cl. 426—393 26 Claims



2. A method for cooking raw or partially cooked foods in vacuum packages, comprising the steps of:
1. encasing the food in a plastic pouch,
2. substantially evacuating air from the pouch and sealing under a high vacuum,
3. immersing the food encased in the pouch in a hot water bath held at a constant elevated temperature for a period of time sufficient to at least partially cook the raw food or further cook the partially cooked food,
4. removing the packaged food from the hot water bath and chilling it for a period of time sufficient to attain an internal temperature of the food of 32°–34°F. which is above but near the freezing point thereof, and
5. storing the cooked food in the pouch above the freezing temperature of the food and at a temperature of 28°–32°F.

3,966,981

PROCESS FOR REMOVING RESIDUAL SOLVENTS

William G. Schultz, El Cerrito, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 26, 1974, Ser. No. 527,402
Int. Cl.² B01D 11/02
U.S. Cl. 426—425 1 Claim

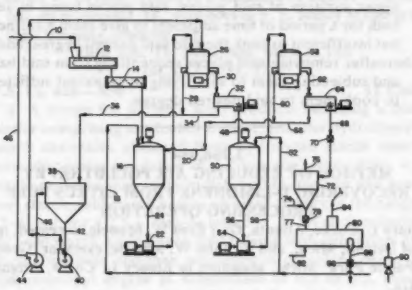
1. A process for removing residual hexane from soybeans which have been de-fatted by extraction with hexane, which process comprises:
a. extracting the de-fatted soybeans with liquid CO_2 at a pressure and temperature at which the CO_2 remains in the liquid state,
b. separating the extracted de-fatted soybeans from the liquid CO_2 extract, and
c. evaporating CO_2 from the extracted de-fatted soybeans.

3,966,982

PROCESS AND APPARATUS FOR TREATING OLEAGINOUS SEED MATERIAL

Kenneth W. Becker; Klemens C. Baczewski, and Donald J. Klein, all of Pittsburgh, Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed June 18, 1973, Ser. No. 371,148
Int. Cl.² A23L 1/20
U.S. Cl. 426—430 35 Claims



1. In a process for treating a defatted oleaginous seed material to extract soluble non-proteinaceous materials therefrom to form a proteinaceous concentrate, the steps comprising:
a. contacting said oleaginous seed material with a first carbohydrate selective extraction solvent flow under conditions to extract a portion of said non-proteinaceous materials;
b. expressing the slurry of solids of step (a) to separate a first miscella stream from a first solids-solvent stream;
c. contacting said first solids-solvent stream of step (b) with a second carbohydrate-selective extraction solvent flow under conditions to extract substantially the remaining portion of said non-proteinaceous material therefrom; and
d. expressing the slurry of solids of step (c) to separate a second miscella stream from a second solids-solvent stream.

3,966,983

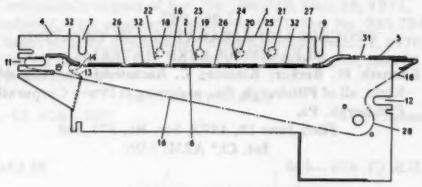
METHOD AND APPARATUS FOR TREATING FOOD PIECES

Edward Dexter, Blaby, and Stephen Reverdy Otley, Long Whatton, near Loughborough, both of England, assignors to United Biscuits Limited, Edinburgh, Scotland

Filed Nov. 7, 1974, Ser. No. 521,846
Claims priority, application United Kingdom, Nov. 15, 1973, 53093/73
Int. Cl.² A21D 6/00; A23L 1/01
U.S. Cl. 426—439 7 Claims

1. In the process of cooking food comprising relatively thin pieces having two generally flat and sticky faces, having a relatively small dimension between said faces as compared to the size of said faces and having a moisture content between thirty and sixty percent, which food is to be fried in a continuous succession to a desired degree, the improvement wherein said pieces are pretreated prior to said frying to minimize the distortion which tends to occur because of the thinness of the pieces comprising the steps of:

supporting said pieces on one of said faces, continuously passing said pieces while so supported in succession through a bath of hot oil with the pieces being only partially immersed therein whereby the pieces do not tend to float but remain firmly supported at said one face, and while said pieces are in said bath applying hot oil to the



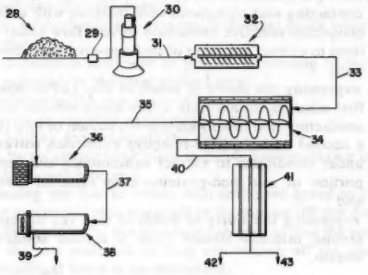
upper surfaces of said pieces, said pieces being in said bath for a period of time sufficient to give them a stiffness but insufficient to cook them to said desired degree; and thereafter removing said pieces sequentially from said bath and subjecting them to said frying to an extent sufficient to cook them to said desired degree.

3,966,984

METHOD OF REDUCING AIR POLLUTION BY RECOVERING D-LIMONENE FROM CITRUS PULP PROCESSING OPERATION

Emory L. Cocke, Atlanta, Ga.; Fred W. Muncie, deceased, late of Detroit, Mich., and by John W. Muncie, executor, Grosse Pointe Park, Mich., assignors to Emory L. Cocke, Atlanta, Ga.

Filed Nov. 27, 1974, Ser. No. 527,718
Int. Cl.² A23L *1/00, 2/06*
U.S. Cl. 426—472 **7 Claims**



1. A method of reducing air pollution by recovering d-limonene from a process for the preparation of dried citrus pulp from a citrus residue, said method comprising:

a. subdividing a citrus residue having a volatilizable component comprising d-limonene, citrus oils, free water and bound water;

b. liming said citrus residue to convert a portion of the bound water to free water;

c. heating and agitating said limed residue where said heating is to a temperature sufficient to convert at least a portion of the remaining bound water to free water and to evaporate at least a portion of free water and liquids to thereby form (1) a vapor component comprising water, citrus oil and d-limonene, and (2) a concentrated solids component;

d. collecting and condensing said vapor component;

e. drying said concentrated solids component at an elevated temperature to remove a major amount of residual water and thereby form a citrus pulp; and

f. cooling said citrus pulp.

3,966,985

FLAVORING AGENT OBTAINED BY REACTING A MONOSACCHARIDE AND A SUPPLEMENTED PLASTEIN

David Andrew Jonas, Ramsgate, England, assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 548,916, Feb. 11, 1975, abandoned. This application Apr. 22, 1975, Ser. No. 571,010
Claims priority, application United Kingdom, Feb. 18, 1974, 7350/74
Int. Cl.² A23L *1/231*
U.S. Cl. 426—533 **17 Claims**

1. A process for preparing a flavoring agent which comprises reacting a mixture of one part by weight of a hexose or pentose monosaccharide and from about one to twenty parts by weight of a plastein supplemented with about 5 to 50% by weight, based on the supplemented plastein, of a sulfur-containing amino acid which is held in a state of peptide bonding to said plastein and which acid is selected from the group consisting of methionine, cysteine, cystine and lanthionine, in water as the reaction medium, the amount thereof providing at least about two parts by weight of water for each part of said supplemented plastein, at a temperature from about 80° to 120°C.

3,966,986

METHOD FOR ENHANCING TEA FLAVOR AND PRODUCT THEREOF

George L. K. Hunter, Atlanta, Ga.; Victor Krampl, Essen, Germany; Charles Thomas Malone, Doraville, Ga., and Gerald Edward Usher, Reading, England, assignors to Tenco Brooke Bond Limited, London, England

Continuation-in-part of Ser. No. 327,056, Jan. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 71,411, Sept. 11, 1970, abandoned. This application Oct. 29, 1974, Ser. No. 518,305
Int. Cl.² A23F *3/00, 1/22*
U.S. Cl. 426—534 **74 Claims**

39. A flavoring agent for enhancing the flavor and aroma of a final tea beverage consisting essentially of about 5–68% of at least one compound selected from the group consisting of linalool and linalool oxide, about 0–15% trans-2-hexenal, about 0–11% 1-penten-3-ol, about 0–8% trans-2-hexen-1-ol, about 2–16% cis-3-hexen-1-ol, about 0–21% iso-butanal, about 0–25% 2-methyl-butanal, about 0–17% propanal, about 0–10% pentanal, about 0–6% hexanal, about 0–46% acetaldehyde, about 0–16% phenylacetaldehyde, about 0–5% methyl salicylate, about 0–4% n-hexanol, about 0–2% ethyl acetate, about 0–0.6% alpha-terpineol, about 0–0.6% nerolidol, about 0–0.3% beta-ionone, about 0–0.3% iso-jasmone, about 0–0.7% benzaldehyde, about 0–2% n-pentanol, about 0–1% n-octanol, about 0–0.7% geraniol, about 0–3% iso-butanol, about 0–0.3 % iso-propanol, about 0–8% n-butanol, about 0–1% phenylethanol, about 0–5% propionic acid, about 0–1% iso-butyric acid, about 0–1.2% n-butyric acid, about 0–4% iso-valeric acid, about 0–4% n-valeric acid, about 0–0.6% 2-methylvaleric acid, about 0–0.06% iso-hexanoic acid, about 0–19% n-hexanoic acid, about 0–10% cis-3-hexenoic acid, about 0–10% trans-2-hexenoic acid and about 0–4% cis-2-penten-1-ol.

3,966,987

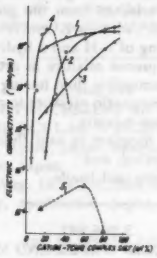
ELECTROCONDUCTIVE HIGH POLYMER COMPOSITION

Tetsuo Suzuki; Katsuhiro Mizoguchi, and Fumio Togo, all of Tokyo, Japan, assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Apr. 8, 1975, Ser. No. 566,613
Claims priority, application Japan, Apr. 17, 1974, 49-43554
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—500 **4 Claims**

1. A high polymer composition which consists essentially of a polymer selected from the group consisting of polyvinylpyri-

dine, polyvinylquinoline, polyacrylonitrile and polyvinylcarbazole and 20 – 90% by weight of a 7,7,8,8-tetracyanoquinodimethane complex salt of N-methylacridinium and has an electric conductivity of at least 10^{-2} mho/cm.



3,966,988

FLAVORING COMPOSITIONS AND PROCESSES UTILIZING DITHIAZINE COMPOUNDS

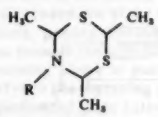
Richard Arnold Wilson, Westfield; Ira Katz, West Long Branch; Manfred H. Vock, Locust, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 166,683, July 28, 1971, abandoned. This application July 8, 1975, Ser. No. 594,099

Int. Cl.² A23L *1/231*

U.S. Cl. 426—535 6 Claims

1. A process for augmenting or enhancing the chicken flavor or aroma of a foodstuff which comprises adding to said foodstuff from about 0.02 up to 100 parts per million by weight of a compound having the structure:



wherein R is hydrogen or methyl.

3,966,989

FLAVORING METHODS AND COMPOSITIONS

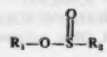
Alan O. Pittet, Atlantic Highlands; John V. Pascale, Jackson, and Denis E. Hruza, Bricktown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 362,886, May 23, 1973, Pat. No. 3,906,119, which is a division of Ser. No. 201,545, Nov. 23, 1971, abandoned. This application June 2, 1975, Ser. No. 582,861

Int. Cl.² A23L *1/235*

U.S. Cl. 426—535 5 Claims

1. A process for imparting a fruity flavor to a foodstuff or augmenting an existing fruity flavor of a foodstuff which comprises adding to said foodstuff from about 0.05 up to 150 ppm of at least one sulfinate according to the formula:



wherein R_1 is selected from the group consisting of methyl, n-hexyl and n-decyl and R_2 is selected from the group consisting of methyl, n-hexyl and n-propyl, provided that when R_1 is methyl, R_2 is n-propyl, or n-hexyl; and provided that when R_2 is methyl, R_1 is n-decyl or n-hexyl.

3,966,990

GRANULAR MODIFIED STARCH BINDER FOR DOUGH FORMING OF PUFFABLE FOOD PRODUCTS

Charles W. Cremer; James E. Eastman, and Robert V. Schanefelt, all of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Feb. 11, 1974, Ser. No. 441,185

Int. Cl.² A23L *1/18*

U.S. Cl. 426—550 11 Claims

1. A dough for puffable food products including a dough binder comprising an alcohol washed, granular hydroxypropyl starch derivative obtained from hydrolyzed starch selected from the group consisting of waxy maize, waxy milo, waxy sorghum, waxy rice, waxy millet, potato, tapioca and arrowroot starch, said starch having an alkali fluidity in the range of 17–61 ml. for a 2.5 g. sample tested in .375N sodium hydroxide, said starch having been first treated with anhydrous disodium phosphate and then reacted with propylene oxide to a hydroxypropyl degree of substitution of 0.3 to 0.5, alcohol washed, and then dried to about 3–5 percent moisture to remove volatile residues, said binder comprising 30–70 percent by weight of said dough.

3,966,991

ANGEL FOOD CAKE MIX

Robert Edward Oborn, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 16, 1975, Ser. No. 623,134

Int. Cl.² A21D *2/02*

U.S. Cl. 426—555 11 Claims

1. In an angel food cake mix comprising sugar, edible farinaceous material and from about 6 to about 12% by weight of dried desugared egg white, the improvement comprising adding an alkali metal bisulfite thereto in an amount of from about 0.005 to about 1.0% by weight of the dried desugared egg white.

3,966,992

TREATMENT OF SOYA

Philip George Banks, Manchester, and William Pringle, Altrincham, both of England, assignors to The British Arkady Company Limited, Manchester

Filed Jan. 30, 1974, Ser. No. 438,173

Claims priority, application United Kingdom, Feb. 3, 1973, 5440/73

Int. Cl.² A23L *1/20;* A23C *21/00*

U.S. Cl. 426—583 11 Claims

1. A process for eliminating or destroying the trypsin inhibitor in soya without significantly affecting the quality of the soya protein, the process comprising heating a mixture comprising soya and whey at a temperature of at least the boiling point of water for a period of time and with an amount of whey sufficient to destroy or eliminate the trypsin inhibitor, and wherein the pH of the mixture is below 5.5.

3,966,993

PROCESS FOR MAKING SOLID SAUCE BAR

John V. Luck, Lakewood, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed May 20, 1970, Ser. No. 39,183
Int. Cl.[2] A23L *1/40, 1/195*
U.S. Cl. 426—589 3 Claims

1. A process for making a sauce bar convertible on mixing with aqueous liquid into an edible sauce which comprises:

a. intimately mixing together 40 to 60 parts of melted, edible emulsified triglyceride fat having acyl radicals of preponderantly C_{16}–C_{18} chain length and having a Wiley melting point of about 100° to 125°F. and a minimum of 30% Solid Fat Index at 70°F., and 15 to 40 parts of farinaceous flour, and 5 to 45 parts of condiment solids having particle size not substantially greater than about 30 microns;

b. tempering the resulting mixture in an agitated tempering zone until fat crystals are generated, forming a solid bar of the tempered mixture under conditions precluding complete remelting of said fat crystals; and

c. cooling the resulting bar until it is dimensionally stable at room temperature.

3,966,994

DRY STABLE INSTANT BEVERAGE MIX

Timothy James Kennedy, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed July 17, 1974, Ser. No. 489,291
Int. Cl.[2] A23L *2/00*
U.S. Cl. 426—590 33 Claims

1. A substantially dry composition for providing flavorful beverages upon the addition of water consisting essentially of: a beverage flavor base containing phosphoric acid as a flavor component and acidulent; and a monoalkali orthophosphate in an amount at least equimolar to the phosphoric acid content of said flavor base;, said composition having been prepared by drying an admixture of water, said flavor base and said phosphate.

3,966,995

COFFEE SUBSTITUTE

Ruth A. Workman, 2109 Dymond St., Burbank, Calif. 91505

Filed Aug. 28, 1975, Ser. No. 608,449
Int. Cl.[2] A23F *1/14*
U.S. Cl. 426—596 2 Claims

1. A material useful for brewing a beverage simulating coffee comprising the outer zone or cortex of carrot root subdivided and roasted to a dark brown colorand essentially devoid of the wood or pith of the core of the carrot root. color and

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3,966,996

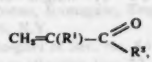
PROCESS FOR PREPARING SPHEROIDAL ALUMINA PARTICLES

Jacques Maurice Jules Andre, Brussels; Hugo Johannes van Thillo, Grimbergen; Rene Odon Lammers, Brussels; Henri Robert Debus, Meise, and Raymond Marc Cahen, Brussels, all of Belgium, assignors to Labofina S.A., Brussels, Belgium

Filed Feb. 10, 1975, Ser. No. 548,213
Claims priority, application Luxemburg, Feb. 18, 1974, 69407
Int. Cl.[2] C01F *7/02*
U.S. Cl. 423—626 13 Claims

1. A process for preparing alumina beads from alumina hydrogel comprising

a. preparing an aqueous mixture containing from 5–30% by weight alumina in the form of alumina hydrogel and from 0.25–20% by weight of a water-soluble acrylic monomer which is polymerizable to an uncross-linked water-soluble polymer or an uncross-linked gel polymer, said acrylic monomer being of the formula



wherein R^1 is selected from a group consisting of —H and —CH_3 and R^2 is selected from the group consisting of —OR^3 and —NR^3R^4, wherein R^3 and R^4 are selected from the group consisting of —H and a hydrophylic radical,

b. dispersing said aqueous mixture as droplets into a substantially water-immiscible fluid having a temperature of 50°–105°C. at atmospheric pressure to effect polymerization of said aqueous mixture,

c. maintaining said droplets in said fluid until individual hard beads are formed, and

d. drying and calcining said beads.

3,966,997

CHOCOLATE SOLID WAFER AND METHOD OF MANUFACTURE

Brian T. Warkentin, Sunnyvale, Calif., assignor to Shade Foods, Inc., Belmont, Calif.

Continuation-in-part of Ser. No. 423,011, Dec. 10, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,300
Int. Cl.[2] A23G *1/00*
U.S. Cl. 426—631 2 Claims

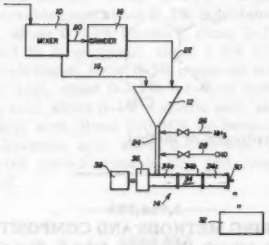
1. A substantially unsweetened homogeneous solid chocolate composition consisting essentially of 25–40 weight percent of cocoa determined on a fat-free basis, 30–40 weight percent of a mixture of hydrogenated vegetable oil having a melting point of at least 100°F. and cocoa butter, said mixture containing 10–25% cocoa butter, 18–25 weight percent of starch, 0–10 weight percent of low-fat milk powder, 0.5–2.0 weight percent of an emulsifying agent and 0.5–3 weight percent of salt.

3,966,998

FEED SUPPLEMENTS FOR RUMINANTS

Robert M. Rawlings, and Anthony Ambrose Maher, both of Boise, Idaho, assignors to Blue Wing Corporation, Boise, Idaho

Filed June 19, 1974, Ser. No. 480,850
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—630 16 Claims



10. A method of producing solid particulate feed supplement for ruminants containing dispersed lipids within a protein-aldehyde complex which is substantially insoluble in the rumen but soluble in the abomasum and lower gut of said ruminants comprising:

a. forming a mixture of a feed material comprising lipid and protein;

b. comminuting said mixture and constantly admixing the comminuted mixture by augering said mixture in an extruder at a temperature within the range of from about 75°F to about 250°F and at a pressure in the range of from

about 5 psig to about 50 psig to form a protein material with lipid globules thoroughly dispersed therein; and

c. contacting said mixture during said augering with an effective amount of an activating agent to activate the protein material and with an effective amount of an aldehyde to react with said protein and form a protein-aldehyde complex around said lipid globules therein; and

d. agglomerating and cooling the resulting mixture from step (c) to form said particulate feed supplement.

3,966,999
METHOD OF PROCESSING AN ORGANIC HIGH MOLECULAR WEIGHT FILM

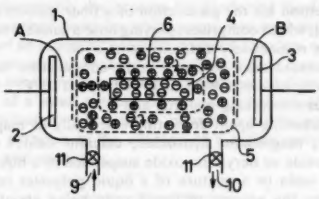
Kazuo Horiguchi, Kyoto, Japan, assignor to Susmu Industrial Co., Ltd., Kyoto, Japan

Filed Aug. 16, 1974, Ser. No. 498,846

Claims priority, application Japan, Sept. 14, 1973, 48-104787

Int. Cl.² B05D *3/06*

U.S. Cl. 427—41 **6 Claims**



1. A method of producing an organic high molecular weight film soluble in an organic solvent and having an essentially uniform softening temperature in a glow discharge tube having discharge electrodes defining a plasma zone therebetween, which comprises the steps of electrically floatingly disposing at least one substrate within the plasma zone, disposing a pair of opposed perforated screening plates between the discharge electrodes, a respective one of the screening plates being adjacent a respective end of the plasma zone, each screening plate being disposed between one of the electrodes and one of the plasma zone ends, passing electric discharge from the discharge electrodes through the screening plates, electrically connecting the screening plates to each other, mounting a perforated plate between the screening plates and parallel to the substrate, the perforated plate extending over the whole area of the substrate, introducing a monomer through the perforated plate into the plasma zone, and depositing the monomer on the substrate to form the film.

3,967,000
RISER PROTECTION FOR ANODES

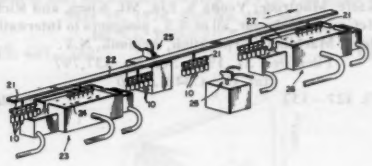
Gerhart P. Klein, Manchester, and Milton Kallianidis, Brockton, both of Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed June 13, 1974, Ser. No. 479,052

Int. Cl.² B05D *5/12, 3/00*

U.S. Cl. 427—58 **8 Claims**

1. A method of applying a layer of material containing polytetrafluorethylene over a riser of an anode adapted for use in an electrical device comprising providing an anode comprising a body including electrically conducting material and a riser projecting from the body, masking the anode body with a liquid, directing particles of a material consisting essentially of polytetrafluorethylene entrained in a medium toward the anode, and depositing particles of said material over the anode



riser, said masking liquid being of such a nature that said particles will not adhere to the anode body.

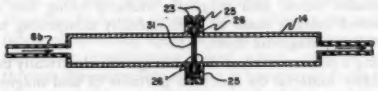
3,967,001
PROCESS OF PREPARING A SECONDARY ELECTRON EMISSIVE COATING ON THE INTERIOR WALLS OF A MICROCHANNEL PLATE

Bipin C. Almaula, Alexandria, Va., and Philip G. Reif, Chatsworth, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 411,884, Nov. 1, 1973, abandoned. This application Sept. 20, 1974, Ser. No. 507,838

Int. Cl.² B05D *5/12*

U.S. Cl. 427—78 **8 Claims**



1. A process of preparing a secondary electron emission surface along the interior walls of a plurality of channels in a microchannel plate, the sequence of steps comprising:

providing a source of inert gas;

providing a source of nickel compound gas;

securing said microchannel plate in a deposition chamber with the outer rim of said microchannel plate sealed air tight against the interior walls of said deposition chamber for forcing said inert gas and said nickel compound gas to flow only through said plurality of channels;

simultaneously passing only said inert gas through said plurality of channels while heating the inside volume of said deposition chamber such that the heated inert gas is forced through the open channels of said microchannel plate to heat said microchannel plate to a temperature much higher than enough to decompose said nickel compound gas and continuing to pass said inert gas through the heated deposition chamber and said plurality of channels for an extensive time to stabilize the temperature of said microchannel plate;

lowering the temperature of said deposition chamber and said inert gas passing through said plurality of channels wherein the temperature of the interior walls of said plurality of channels is sufficient to decompose said nickel compound gas;

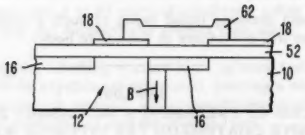
after the step of lowering the temperature, mixing said nickel compound gas and said inert gas in a mixture chamber prior to passing the resulting gas mixture through said plurality of channels at said lower temperature for sufficient time to decompose a nickel layer on the interior walls of said plurality of channels; and

providing an absorption tank having a nitric acid solution therein at the output of said deposition chamber to neutralize the unreacted nickel compound gas passed through said absorption tank and exhausting the resulting harmless gases to the atmosphere.

3,967,002
METHOD FOR MAKING HIGH DENSITY MAGNETIC BUBBLE DOMAIN SYSTEM

George S. Almasi, Katonah; Robert J. Hendel, Beacon; George E. Keefe, Montrose; Yeong S. Lin, Mt. Kisco, and Richard P. McGouey, Mahopac, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1974, Ser. No. 537,797
Int. Cl.² C04B 35/00
U.S. Cl. 427—132 26 Claims



1. A method for fabricating magnetic bubble domain chips, comprising the steps of:

forming a patterned magnetic layer over a substrate which includes a magnetic medium in which said bubble domains can exist, said patterned magnetic layer defining at least a sensor area and a propagation area of said bubble domain chip, said propagation area including ion implanted patterns along the edges of which said bubble domains move, said magnetic medium being ion implanted using a mask at least partially comprising said patterned magnetic layer,

forming a patterned layer of non-magnetic electrically conductive material on specified portions of said magnetic layer using a critically aligned mask.

22. A method for fabricating a magnetic bubble domain chip, comprising the steps of:

forming magnetic elements on a substrate comprised of a magnetic medium in which said bubble domains can exist,

ion implanting said magnetic medium in areas surrounding said magnetic elements to produce ion implanted patterns along the edges of which said bubble domains will move in response to the reorientation of a magnetic field,

forming a patterned metallic layer using a mask aligned with respect to said magnetic elements and said ion implanted regions.

3,967,003
HARDENING OF COATING CONTAINING ALUMINUM HYDROXYHALIDES USING A MIST OF ACETATE OR LACTATE

Harold Garton Emblem, Mirfield, and Graham Kenwood Sargeant, Dartford, both of England, assignors to Zirconal Processes Limited, England

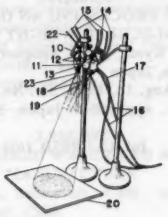
Filed Aug. 1, 1974, Ser. No. 493,783
Claims priority, application United Kingdom, Apr. 1, 1974, 14303/74
Int. Cl.² B05D 1/38
U.S. Cl. 427—133 5 Claims

1. A method of preparing a mold suitable for use in the casting of metals comprising the steps of (1) coating an expendible pattern with a composition consisting essentially of a finely divided refractory powder dispersed in an aqueous alcoholic solution of an aluminum hydroxyhalide of the general formula $Al_2(OH)_xX_{(6-x)}.mH_2O$ or a polymer thereof, where n is a number less than 6, m is a number less tha 4 and x represents a chlorine, bromine or iodine atom, (2) dusting a coarse refractory material onto the resulting wet coating and (3) then hardening the resulting coating by contacting it with a mist of a solution of an acetate or a lactate that renders the mist solution thereof alkaline.

3,967,004
METHOD FOR THE PRODUCTION OF FIBER-REINFORCED RESIN COMPOUNDS

Kouzou Oda, No. 436-1, Yashiro, Yashiro-cho, and Hidefumi Miki, No. 449-1, Yashiro, Yashiro-cho, both of Kato, Hyogo, Japan

Continuation-in-part of Ser. No. 284,055, Aug. 28, 1972, abandoned. This application Dec. 17, 1973, Ser. No. 425,129
Int. Cl.² B05D 1/34, 1/36
U.S. Cl. 427—196 4 Claims



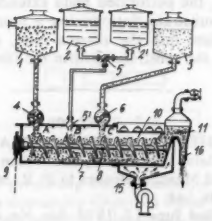
1. A method for the production of a fiber-reinforced resin compound, which comprises spraying onto a suitable substrate from three respectively different nozzles:

1. an unsaturated polyester resin composition having a viscosity of abou: 3000 to 15000 Cps at 25°C;
2. a fiber-reinforcing material and
3. a thickening agent consisting essentially of magnesium oxide, magnesium hydroxide, calcium oxide, calcium hydroxide or beryllium oxide suspended in a liquid polyester resin or a mixture of a liquid polyester resin and styrene the amount of liquid resin being about 2 to 5 times by weight of the thickening agent, the weight of (1):(2):(3) being 100:20–55:3–30; said three respective streams of (1), (2) and (3) intersecting one another after exiting from said nozzles and prior to contacting said substrate to form one stream.

3,967,005
METHOD FOR ENVELOPING PELLETS OF FOAMED POLY-STYRENE SUITABLE FOR PRODUCING LIGHTENED MANUFACTURED ARTICLES OF CEMENT

Mario Cattaneo, Via Simplone, 6, Bergamo, Italy (24100)

Filed Dec. 11, 1974, Ser. No. 531,604
Claims priority, application Italy, Dec. 14, 1973, 3012/73
Int. Cl.² C04B 31/44
U.S. Cl. 427—202 5 Claims



1. A method for enveloping foamed polystyrene pellets suitable for producing lightened manufactured articles of cement, the method substantially comprising the continuous steps of:

introducing a stream of foamed polystyrene pellets into a mixing unit;

feeding the pellets to a first station of said unit;
continuously introducing at said first station a proportioned amount of water and water dispersible synthetic resins;
feeding the so wetted pellets to a second station of said unit;
continuously introducing at said second station an inert filler in a proportioned amount;
feeding all of the material to a third station of said unit;
presenting an obstacle to the progression of material in said unit to cause momentary accumulation of said material at a drying and polymerization zone;
applying heat to the accumulated material at said zone to enhance drying and polymerization of said material; and
thereafter delivering said material to an outlet of said unit.

3,967,006

DRY PROCESS FOR THE PRODUCTION OF PLASTIC-COATED INORGANIC SUBSTANCES

Tadashi Yamaguchi; Takayuki Ono, both of Sendai; Hiroshi Hoshi, Narashino; Michio Hirakawa, and Isao Watanabe, both of Ichikawa, all of Japan, assignors to Lion Yushi Kabushiki Kaisha (Lion Fat & Oil Co., Ltd.), Tokyo, Japan

Filed Feb. 1, 1974, Ser. No. 438,534
Claims priority, application Japan, Feb. 3, 1973, 48-13918
Int. Cl.² B05D *7/00*
U.S. Cl. 427—221 **6 Claims**

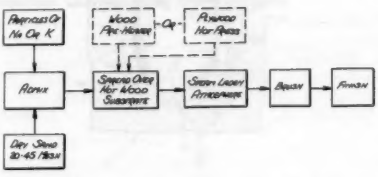
1. A substantially dry process for producing vinyl polymer coated inorganic particles which comprises applying to core particles of an inorganic granular material a surface coating of a vinyl monomer and suspending said monomer-coated particles in an atmosphere containing gaseous sulfur dioxide in the presence of a small amount of water or lower alcohol sufficient to initiate polymerization of said monomer coating on said core particles in the absence of a radical polymerizing agent for said monomer.

3,967,007

METHOD FOR PRODUCING DISTRESSED WOOD

Hong Man Lee, White Plains, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Filed Nov. 6, 1974, Ser. No. 521,252
Int. Cl.² B05D *3/08*
U.S. Cl. 427—223 **9 Claims**



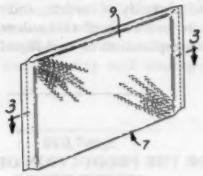
1. The method of distressing wood comprising the steps of admixing a quantity of particles selected from the group consisting of metallic sodium and metallic potassium with dry sand having a grain size of about 20 to 45 mesh, distributing said mixture over a surface of a wood substrate, introducing this wood substrate into a steam laden atmosphere, inducing spontaneous combustion in said particles in said steam laden atmosphere, and thereafter brushing said surface to remove burned residues and loose charcoal.

3,967,008

TREATMENT OF FABRICS IN MACHINE DRYERS

William G. Mizuno, and Iris N. Henderson, both of St. Paul, Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Division of Ser. No. 232,432, March 7, 1973. This application May 16, 1974, Ser. No. 470,565
Int. Cl.² B05D *3/12, 3/02*
U.S. Cl. 427—242 **9 Claims**



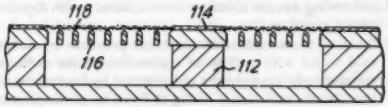
1. The method of conditioning fabrics which comprises the steps of:
a. positioning a fabric-conditioning agent as a bar or consolidated, reuseable form, which form is solid at normal room temperature, within the drum of a machine dryer, said drum including a rotatable cylindrical drum wall, said agent being in a form which is heat softenable at temperatures within the operating temperature range of the dryer; and said agent being enclosed within a dispenser body having a permeable surface through which only a small amount of said enclosed fabric conditioning agent can pass when it is softened by heating of said dispenser body in a dryer, thereby allowing the enclosed fabric-conditioning agent to act as a long lasting reservoir for fabric conditioning agent which, after it passes through the permeable surface, is transferred to the fabric being treated by contact between the fabric and the permeable surface of the dispenser body; said dispenser body being secured to a portion of the dryer drum;
b. drying and conditioning fabric by means of the step of tumbling fabric in said dryer by rotation of said cylindrical drum wall and by heating the dryer during rotation of said drum wall, thereby causing some of the fabric-conditioning agent to be transferred to the fabric by contact between the tumbling fabric and the permeable portion of said dispenser body.

3,967,009

METHOD FOR APPLYING LIQUID TO A SUBSTRATE

Charles William Blake, Basingstoke, England, assignor to McCorquodale Colour Display Limited, Basingstoke, England

Filed Sept. 13, 1974, Ser. No. 505,927
Claims priority, application United Kingdom, Sept. 13, 1973, 43119/73
Int. Cl.² B41M *5/00*
U.S. Cl. 427—256 **16 Claims**



1. A method for applying liquid to a plurality of accurately defined spaced areas on each of a succession of like substrates, said method comprising the steps of:
providing a rigid bed having a horizontal upper surface formed with a plurality of spaced outlets, said outlets being shaped and spaced to correspond with said defined

areas and containing porous or foraminous material having an upper surface substantially coplanar with said horizontal upper surface;

supplying liquid to said rigid bed such that liquid is in wetting contact with said material at each of said plurality of outlets and stands at a level no higher than said upper surface of said material;

successively applying said plurality of substrates with the application of pressure to said rigid bed such that said plurality of areas on each of said substrates is impressed onto said plurality of outlets; and

removing in turn each of said substrates from said rigid bed after application of said liquid.

3,967,010
PROCESS FOR THE PRODUCTION OF METAL-PLATED STAPLE FIBERS

Minoru Maekawa, Okayama, Japan, assignor to Kuraray Co., Ltd., Okayama, Japan

Filed Nov. 11, 1974, Ser. No. 522,895

Claims priority, application Japan, Nov. 30, 1973, 48-135580

Int. Cl.² B05D *3/04, 3/10*

U.S. Cl. 427—306 **12 Claims**

1. A process for the production of metal plated staple fibers comprising providing said fibers having an areal weight of 0.5 to 5.0 kg/m², activating said fibers and spraying an electroless metal plating solution onto the activated fibers at a space velocity of 100 to 600 m³ of said solution per m³ of said fibers per hour.

3,967,011
PROCESS FOR IMPREGNATING WOOD

James L. Dunn, Jr., Lake Jackson, and Harold G. Liddell, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 728,755, May 13, 1968, abandoned. This application June 25, 1973, Ser. No. 372,875

Int. Cl.² C08J *7/08*

U.S. Cl. 427—345 **6 Claims**

1. A substantially non-polluting wood treating process for the impregnation of wood with preservatives to obtain substantially uncolored, natural appearing wood which consists of

1. contacting, in a pressure vessel, wood with a solution of a wood preservative dissolved or suspended in a liquid halogenated hydrocarbon solvent at a pressure of from atmospheric pressure up to about 150 psig for a period of time sufficient to incorporate an amount of preservative into the wood and penetrate preservative to a depth into the wood to provide the desired protection, said solvent being non-flammable by Tag Closed Cup; having a specific gravity greater than 1.1, a heat of vaporization less than 150 BTU/No. (78.6 cal/gm) and immiscible with water;
2. removing excess solution from contact with the impregnated wood and
3. heating the wood under ambient pressure by contacting said wood with a flow of steam for a time sufficient to substantially remove the chlorinated hydrocarbon solvent therefrom, said steam being at from its atmospheric boiling point to its boiling point at about 30 psig; withdrawing the vapors from the pressure vessel and
4. condensing the vapors;
5. separating the solvent from the water condensate;
6. recycling the condensate water to the steam treatment for generation of steam, recycling the solvent for reuse in preparing the solution of wood preservative for the impregnation step.

3,967,012
METHOD OF MAKING A SEALING AND INSULATING COATING

Jakob Ebner, Regensburg, Germany, assignor to Gundermann GmbH & Co. KG, Regensburg, Germany

Continuation of Ser. No. 216,823, Jan. 10, 1972, abandoned. This application Apr. 1, 1974, Ser. No. 457,129

Int. Cl.² B05D *3/02;* B32B *25/00*

U.S. Cl. 427—380 **1 Claim**

1. A process for applying an insulating, sealing and moisture-barrier coating to a solid concrete or metal body, comprising the steps of:

forming a thermally coagulatable emulsion composition of substantially equal parts by weight of a styrenebutadiene rubber latex, colloidal polystyrene, polyurethane and natural rubber latex, substantially 10% by weight of a mixture of substantially equal parts of polyethylene glycol ether and polyvinylmethylether as thermal sensitizers capable of coagulating said composition upon heating but not effecting coagulation in the absence of heating, a filler selected from the group which consists of asbestos fibers, asbestos meal and shale meal, and an antiaging stabilizer making up 60 to 75% of the composition and the composition having the consistency of a paste;

applying said composition in the form of a paste to said body;

heating said paste on said body to a temperature for a period sufficient to effect coagulation of the composition on said body without material evaporation of water therefrom, thereby forming a coherent layer; and

thereafter heating said layer to dryness to effect a chemical transformation of said layer and produce a tough adherent layer whose adhesivity increases until said layer is thoroughly dry.

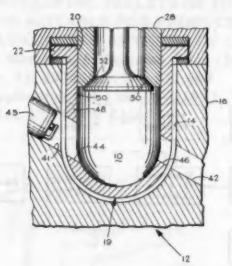
3,967,013
METHOD OF MAKING A COMPOSITE ARTICLE FOR RAPID HEATING

Louis J. Danis, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 408,697, Oct. 23, 1973, Pat. No. 3,892,216. This application Jan. 6, 1975, Ser. No. 538,821

Int. Cl.² C23C *1/08*

U.S. Cl. 427—383 **2 Claims**



1. The method of making a composite article for initial rapid heating and subsequent continuous rapid transfer of heat comprising the steps of:

a. forming a generally elongated tubular cup of copper material,

b. immersing said cup in a bath of molten material of eutectic aluminum-silicon alloy; and

c. removing said cup from the bath and heating same to a temperature in the range 775° – 835°C for a predetermined time such that said bath material is dispersed into said copper material.

3,967,014

RUBBER ARTICLES HAVING IMPROVED SLIP COATING

Pascal E. Esemplare, Mountainside, N.J., and Dennis Beeferman, Brooklyn, N.Y., assignors to Sutures, Inc., Coventry, Conn.

Division of Ser. No. 405,863, Oct. 12, 1973, Pat. No. 3,919,442. This application July 16, 1975, Ser. No. 596,529
Int. Cl.² B32B *25/08, 25/12, 27/00;* A41D *19/00*
U.S. Cl. 427—385 5 Claims

1. A method of providing an adherent, extensible, essentially rubber free slip coating on a rubber surface comprising contacting a rubber surface with an aqueous synthetic resin latex essentially free of rubber and comprising from 5 to 90 percent by weight of a first resin copolymer component selected from the group consisting of vinyl chloride-alkyl acrylate copolymer, vinylidene chloride-alkyl acrylate copolymer, and vinyl acetate-alkyl acrylate copolymer and from 95 to 10 percent by weight of a second resin copolymer component selected from the group consisting of vinyl chloride-vinyl ester copolymer and vinylidene chloride vinyl ester copolymer, to provide a coating of said latex on said rubber surface, and permitting said coating to form a resin slip coating on said rubber surface.

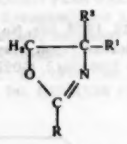
3,967,015

PROCESS FOR DYEING GLASS TEXTILES

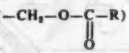
Jerry H. Hunsucker, Terre Haute, Ind., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Continuation-in-part of Ser. No. 296,400, Oct. 10, 1972, abandoned. This application Apr. 1, 1974, Ser. No. 457,027
Int. Cl.² C03C *25/02;* B05D *1/38;* D06P *3/80;* B32B *17/04*
U.S. Cl. 427—386 12 Claims

1. In a process for dyeing a glass fiber textile by the steps of applying thereto a water-soluble thermosetting resin composition, heating to about 370°F for 30 minutes, immersing in a bath of disperse or acid dye at about 200°F for about 30 minutes and drying same, the improvement consisting of using as said resin composition a combination of (a) 60 parts of an oxazoline corresponding to the formula:



wherein R is heptadecyl and R^1 and R^2 can be methyl, ethyl, hydroxymethyl or the group



and can be the same or different, and (b) 40 parts of a thermosetting epoxy resin prepared by heating an epoxy resin with C_{18} mixed unsaturated fatty acids, followed by heating with trimethylolethane and dimethylolpropionic acid, then heating with phthalic anhydride and solubilizing the resin thereby produced with 2-amino-2-methyl-1-propanol.

3,967,016

REINFORCED WALLBOARD

Joseph W. Schneller, Williamsville; Duane C. Bennett, Eggertsville, and George P. Matiacio, Cheektowaga, all of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Aug. 28, 1974, Ser. No. 501,332
Int. Cl.² B05D *3/02, 1/18;* B32B *27/40*
U.S. Cl. 427—393 8 Claims

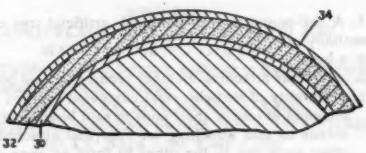
1. The method of improving the strength of paper-covered gypsum wallboard comprising the steps of impregnating substantially the full thickness, which is about .020 inch, of at least portions of the area of a paper cover sheet on the back face of a gypsum wallboard with a substantially water-free resinous solution and allowing said impregnant to solidify therein.

3,967,017

METHOD OF COATING A VEHICLE TEST BED ROLLERS

John Anthony Marten, Swan Lodge, Holt, Norfolk, England

Division of Ser. No. 318,906, Dec. 27, 1972, Pat. No. 3,841,151, Continuation-in-part of Ser. No. 124,403, March 15, 1971, abandoned. This application July 18, 1974, Ser. No. 489,804
Claims priority, application United Kingdom, Mar. 17, 1970, 12867/70
Int. Cl.² B05D *1/06*
U.S. Cl. 427—405 7 Claims



1. A method for coating a metallic roller with an abrasive, wear-resistant surface coating comprising the steps of:

coating said roller with an innermost layer of molybdenum particles;

flame spraying onto said innermost layer a first intermediate layer of stainless steel particles, a second intermediate layer of ceramic particles, and an outermost layer of stainless steel particles, said stainless steel particles being larger than said ceramic particles; and blending said molybdenum, stainless steel, and ceramic particles to form a composite molybdenum-ceramic-stainless steel core within said surface coating.

3. A method of covering a metallic roller comprising the steps of:

coating said roller with molybdenum particles;

flame spraying a first layer of stainless steel particles onto said molybdenum particles; and

coating said first layer with ceramic particles, said stainless steel particles being larger than said ceramic particles, whereby said ceramic particles blend into said first layer of stainless steel particles to produce an abrasive, wear-resistant surface coating on said roller.

3,967,018

METHOD OF SURFACE TREATMENT OF POLYTETRAFLUOROETHYLENE

Jiri Jansta, Kostelec nad Labem, and Frantisek Dousek, Prague, both of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Sept. 30, 1974, Ser. No. 510,731
Claims priority, application Czechoslovakia, Oct. 3, 1973, 6806-73
Int. Cl.² B32B 27/00; B05D 1/18
U.S. Cl. 427—430 4 Claims

1. A technique for treating the surface of polytetrafluoroethylene which comprises immersing the polytetrafluoroethylene in an alloy selected from the group consisting of (a) mercury and an alkali metal and (b) mercury and an alkali metal in combination with an alloy of mercury and an alkaline earth metal at a temperature less than 300°C.

3,967,019

ORNAMENTAL ARTIFICIAL TREE

Audra Fay Magee, 430 Huron Ave., Bogalusa, La. 70427

Filed Nov. 29, 1974, Ser. No. 528,016
Int. Cl.² A47G 33/06
U.S. Cl. 428—7 8 Claims

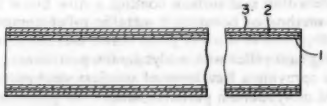
1. A self-supporting, ornamental, artificial tree consisting essentially of:
   a. a base;
   b. a circular attaching member secured to said base;
   c. a plurality of straight, rigid elongated support members attached at one of their ends to said base by attachment means to said attaching member and attached at their other ends one to the other to form an apex of a cone shape, said attached support members together forming the cone-shaped ornament support frame, said elongated members have formed in one end thereof a loop through which said attaching member passes; and
   d. ornaments attached to said cone-shaped, ornament support frame.

3,967,020

COATED METAL PIPE

Masaru Uemura; Hitoshi Kuroki; Nobuhiro Echida; Yujiro Kosaka, and Kanji Otomo, all of Yokohama, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Nov. 20, 1974, Ser. No. 525,661
Claims priority, application Japan, Feb. 15, 1974, 49-018870
Int. Cl.² F16L 58/10, 58/12
U.S. Cl. 428—36 16 Claims



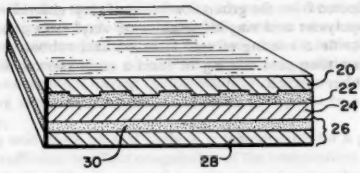
1. A coated metal pipe which comprises a pipe coated with a composition comprising 5–30 wt parts of ethylene-vinylacetate copolymer having a vinylacetate content of 15–40 wt% and a melt index of 1–1000 g/10 min; 2–20 wt parts of low molecular weight oxidized polymer of ethylene-vinylacetate copolymer, polypropylene or propylene-ethylene copolymer; 5–30 wt parts of styrene-butadiene copolymer; 5–50 wt parts of a rosin tackifier and 10–80 wt parts of asphalt.

3,967,021

DECALCOMANIAS EMPLOYED IN OFFSET TRANSFER PROCESS

Saul W. Weingrad, Hillsdale, N.J., assignor to Pictorial Productions, Inc., Mount Vernon, N.Y.

Division of Ser. No. 139,044, April 30, 1971, abandoned. This application Feb. 12, 1973, Ser. No. 331,564
Int. Cl.² B44C 3/12; B32B 7/06
U.S. Cl. 428—40 3 Claims



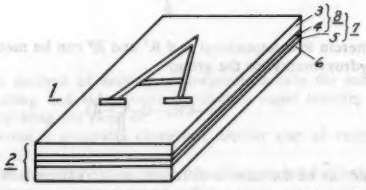
1. A decalcomania comprising;
   a substrate,
   a release layer bonded to said substrate,
   a second adhesive film layer bonded to said release layer,
   a design layer bonded to said second adhesive film layer, and
   a first adhesive film layer bonded to said design layer, both of said first and second adhesive film layers being temperature sensitive, so that said first adhesive film layer softens and becomes adhesive when heated to a temperature within a first temperature range and said second adhesive film layer softens and becomes adhesive when heated to a temperature within a second temperature range, said first temperature range is from about 100°F to about 110°F said second temperature range is from about 150°F to about 160°F. both said first and second adhesive film layers being substantially non-adhesive outside of said first and second temperature ranges, respectively.

3,967,022

ADHESIVE LABEL

Taeko Hasei, 25 Go 4 Ban, Ekimae cho 2-chome, Okayama, Japan

Filed Apr. 25, 1975, Ser. No. 571,848
Claims priority, application Japan, May 2, 1974, 49-049897
Int. Cl.² B32B 7/06, 7/12; G09F 3/02, 3/04
U.S. Cl. 428—40 6 Claims



1. A laminate consisting of
   a flat backing board,

one major face of a vinylchloride film removably adhered to the backing board through the inherent adhesiveness of the film and not through use of a bonding agent,

a releasing agent on the other surface of the vinylchloride film,

a coating of an adhesive agent on said other surface of the vinylchloride film,

the releasing agent enabling the vinylchloride film to be peeled off the adhesive agent coating, and

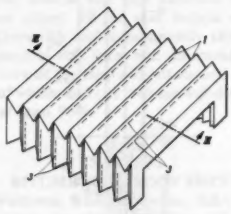
a sheet bonded to the adhesive agent coating and carrying printed information.

3,967,023

ACCORDION-PLEATED ARTICLE OF MANUFACTURE

Franz Lysek, Bielefeld, Germany, assignor to Moeller-Werke GmbH, Brackwede, Germany

Continuation of Ser. No. 339,106, March 8, 1973, abandoned.
This application Jan. 8, 1975, Ser. No. 539,610
Int. Cl.² B65G *13/00*
U.S. Cl. 428—102 5 Claims



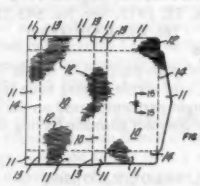
1. A cover, particularly for covering a guide element of predetermined cross-section, comprising a single-ply elongated channel-shaped cover element provided with a plurality of accordion pleats, each having an outer folded edge region; and shape-retaining reinforcing members of flexible but kink-resistant sheet material mounted in said edge regions of at least some of said pleats and extending across the free cross-section of said cover element, said members being formed with cut-outs adapted to matingly interengage with the guide element being covered, whereby such mating interengagement prevents said cover from accidentally lifting off the guide element.

3,967,024

FROZEN FISH PACKAGE

Laurence R. Beath, Kenogami, and Alexander M. Vessie, Lachute, both of Canada, assignors to The Price Company Limited, Quebec, Canada

Filed Mar. 18, 1974, Ser. No. 451,971
Int. Cl.² B32B *3/26*
U.S. Cl. 428—155 6 Claims



1. A folder comprising a fibrous paperboard body covered on both faces by compression-fracturable, wax-blend coatings which are substantially impervious to water and water vapour, each of said coatings having a large number of compression micro-fractures rendering the folder pervious to air but substantially impervious to water.

3,967,025

MAGNETIC RECORDING MATERIAL

Takashi Tanabe, and Tomio Adachi, both of Sagamihara, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 300,174, Oct. 24, 1974, abandoned.
This application June 28, 1974, Ser. No. 484,152
Claims priority, application Japan, Oct. 27, 1971, 46-84663
Int. Cl.² G11B *5/70, 5/78, 5/84*
U.S. Cl. 428—155 6 Claims

1. A magnetic recording material comprising a base film of a crystalline polymer and a magnetic layer coated on a first surface of said base film, the first surface of said base film on which the magnetic layer is coated being sufficiently smooth to prevent the occurrence of dropout, the second surface of the film being finely rugged to impart good running property to the base film, such fine ruggedness resulting from

differentially crystallizing said base film such that said second surface has at least 5 percent higher degree of crystallization than said first surface and thereafter stretching said film in at least one direction whereby said second surface, having the higher degree of crystallization, becomes finely rugged, such good running property resulting solely from said fine ruggedness of said second surface,

said base film not containing fine particles in an amount to impart noticeable ruggedness or dropout to the film.

3,967,026

CAMOUFLAGE SHEET AND METHOD FOR MANUFACTURING THE SAME

Gunnar Dalblom, Solna, Sweden, assignor to Barracudaverken Aktiebolag, Gamleby, Sweden

Filed Oct. 25, 1974, Ser. No. 518,206
Claims priority, application Sweden, Nov. 1, 1973, 7314888
Int. Cl.² B32B *3/00*; E04F *10/00*
U.S. Cl. 428—195 11 Claims

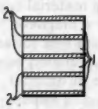
1. A method of manufacturing a camouflage sheet bearing an overall camouflage pattern composed of a plurality of contiguous component patterns having the general outline of a 3-, 4-, 6-, or 8-sided figure and each coextensive with a respective zone of the sheet, wherein the individual component patterns present the same irregular pattern features and the overall pattern is built up by separately applying the pattern features to the respective zones of the sheet and arranging for the pattern features of at least the majority of adjacent pairs of component patterns to be angularly offset relatively to one another by at least 45° and at most 315°.

3,967,027

STABLE ELECTRET RETAINING A HIGH SURFACE POTENTIAL AND METHOD OF MAKING THE SAME

Yuriko Igarashi, Musashino, and Haruko Kakutani, Tokyo, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 99,974, Dec. 21, 1970, abandoned. This application May 8, 1974, Ser. No. 468,102
Claims priority, application Japan, Dec. 19, 1969, 44-101622
Int. Cl.[2] B32B 7/02, 7/04, 31/12
U.S. Cl. 428—212 12 Claims



1. A stabilized layer electret having a high surface potential consisting of a laminate of a plurality of unit electrets, free from metal layers, each unit electret is formed from a sheet of film of a first high molecular weight plastic substance selected from the group consisting of polymethyl (methacrylate), poly (ethylene terephthalate), polycarbonate, polyvinylidene fluoride and mixtures thereof, said unit electrets being laminated in such a manner that surfaces to be faced to each other have opposite charges, and insulation layers of a second high molecular weight plastic substance having an electrical volume resistivity on the order of at least 10^{15} ohm-cm having a higher electrical resistivity than said first plastic substance, said insulation layers having a a thickness of from 4 to 100 microns and being applied at least to both outer surfaces of said laminate.

6. In a method of producing a layered electret comprising forming a laminate of a plurality of unit electrets wherein each unit electret is formed from a sheet of film of a high molecular weight organic substance selected from the group consisting of polymethyl (methacrylate), poly(ethylene terephthalate), polycarbonate, polyvinylidene fluoride and mixtures thereof, the improvement which consists of laminating said unit electrets in such a manner that the surfaces facing one another are of opposite charges, and covering both outer surfaces of said laminate with a thin film of a high molecular weight organic substance having an electrical volume resistivity on the order of at least 10^{15} ohm-cm and an electrical volume resistivity higher than that of said polar high molecular weight organic substance.

3,967,028

SEALED FOAM WEB

Heinz Müller, Hamburg; Bodo Szonn, Pinneberg; Peter Jauchen, and Rolf Schulze, both of Hamburg, all of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Germany

Filed Dec. 12, 1974, Ser. No. 532,109
Claims priority, application Germany, Dec. 21, 1973, 2363802
Int. Cl.[2] B32B 3/26
U.S. Cl. 428—214 8 Claims

1. A sealed foam web which comprises a web of polyurethane, polyvinyl chloride or polyethylene foam, at least one side of which is covered with an adhesive intermediate layer of elastic polyurethane, said intermediate layer being bonded to said web and to a thin, hard thermosetting plastic sealing layer of a urea-formaldehyde resin or a melamine resin.

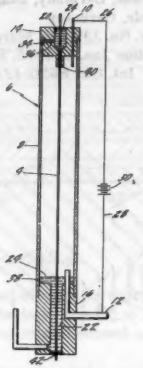
2. A web according to claim 1 wherein said sealing layer is up to 10 microns in thickness, and said intermediate layer is up to 70 microns in thickness.

3,967,029

BORON-CARBON ALLOY TAPE

Richard D. Veltri, East Hartford, Conn.; Roy Fanti, Springfield, Mass., and Francis Salvatore Galasso, Manchester, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 2, 1973, Ser. No. 337,358
Int. Cl.[2] C23C 11/00
U.S. Cl. 428—216 6 Claims



1. A high strength composite tape at least one mil in thickness suitable for use as a reinforcement in resin or metal matrix composite articles comprising:

a substrate consisting essentially of carbon tape; and

a continuous coating adhered to the entire surface of said substrate consisting essentially of boron-carbon alloy, said coating consisting essentially of 15–40 atomic percent carbon, remainder boron.

3,967,030

SILOXANES

Gordon Carlton Johnson, Armonk; Richard Bruce Metzler, Ossining, both of N.Y., and Donald Leroy Bailey, Sistersville, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 390,408, Aug. 22, 1973. This application Jan. 22, 1975, Ser. No. 543,127
Int. Cl.[2] B32B 33/00
U.S. Cl. 428—266 5 Claims

1. An article of manufacture, a textile having improved water repellency, said textile having been treated with about 0.2 to about 3 weight per cent, based on the dry weight of the textile, of a quadripolymer siloxane having the average structure

$$R_3SiO(R_2SiO)_a(RHSiO)_b(H_2SiO)_cSiR_3$$

in which a has a value of from 27 to 55, b has a value of from 4 to 15, c has a value of 4.5 to 10, the ratio of b:a is from 0:1:1 to 0.35:1, the ratio of c:a is from 0.1:1 to 0.25:1, the ratio of b:c is from 0.9:1 to 1.6:1, the degree of polymerization is from about 35 to 80; and R is alkyl of from 1 to 3 carbon atoms.

3,967,031

PRINTABLE PRESSURE-SENSITIVE ADHESIVE TAPE

Richard J. Lambert, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 252,096, May 10, 1972, abandoned. This application Apr. 25, 1974, Ser. No. 463,979
Int. Cl.² C09J 7/02
U.S. Cl. 428—294 6 Claims

1. In a pressure-sensitive tape comprising a backing, a layer of normally tacky and pressure-sensitive adhesive coated over and firmly adherently bonded to the face side of said backing, and a low adhesion backsize coated over and firmly adherently bonded to the back side of said backing,

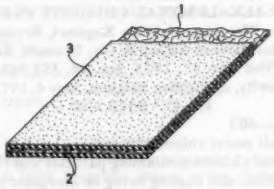
the improvement which comprises (1) utilizing biaxially oriented polyethylene terephthalate film as the backing and (2) utilizing as the low adhesion backsize a blend of polymers consisting essentially of 5 to 80 parts by weight of cellulose acetate butyrate and correspondingly 95 to 20 parts by weight of synthetic polymer selected from the class consisting of linear saturated ethylene terephthalate:ethylene isophthalate copolyesters, whereby (a) the back side of said tape can be printed with flexographic ink indicia and said adhesive will not remove more than about 5% of said indicia when placed in contact therewith and subsequently stripped away, (b) when wound in roll form and unwound therefrom, the unwind force of the tape will not exceed about 70 ounces per inch of width, and (c) the tape will display in adhesion value of at least 95%.

3,967,032

BITUMINIZED ROOF SHEET

Kurt Plotz, Waldems; Klaus Breschar, Schwalbach, Taunus, and Albert Klein, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sept. 5, 1974, Ser. No. 503,331
Claims priority, application Germany, Sept. 8, 1973, 2345484
Int. Cl.² E04D 5/02, 5/06; B32B 27/02
U.S. Cl. 428—300 7 Claims



1. In a bituminized roofing material comprising a sheet of bitumen reinforced with a spun fleece of synthetic polyester filaments, said filaments having a filament bonding coating thereon, the improvement which comprises a filament bonding coating consisting essentially of a copolymer of 45 to 55 weight percent of an acrylic or methacrylic acid ester of a monohydric alcohol having from 1 to 8 carbon atoms, from 24 to 30 weight percent of acrylonitrile from 12.5 to 30 weight percent of styrene and from 0.5 to 2.5 weight percent of acrylic acid amide.

4. The method of making a bituminized roofing material which comprises forming a spun fleece of synthetic polyester filaments, impregnating said fleece with a neutral to weakly alkaline aqueous dispersion of a copolymer of 45 to 55 weight percent of an acrylic or methacrylic acid ester of monohydric alcohol having from 1 to 8 carbon atoms, from 24 to 30 weight percent of acrylonitrile, from 12.5 to 30 weight percent of styrene and from 0.5 to 2.5 weight percent of acrylic acid amide, drying said fleece to cause said copolymer to bond the filaments of said fleece, calendering said fleece and thereafter bituminizing and sanding the impregnated and calendered fleece.

3,967,033

FIRE-RETARDANT PANEL CONSTRUCTION

Robert E. Carpenter, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Dec. 22, 1975, Ser. No. 643,517
Int. Cl.² B32B 3/26
U.S. Cl. 428—307 6 Claims

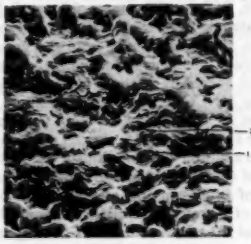
1. A fire-resistant insulating structural panel having outer planar metallic skin surfaces and a laterally coextensive inner core assembly of a layer of foamed polymeric material of which at least one side thereof adjoins a thermal barrier layer comprising a solid water-in-oil emulsion wherein the continuous phase is a thermoset polymerization product of an unsaturated linear polyester and a vinyl monomer crosslinking agent.

3,967,034

PRESSURE SENSITIVE COATINGS

Frederick Weldon Meadus; Bryan David Sparks, and Ira Edwin Puddington, all of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Dec. 20, 1972, Ser. No. 316,726
Claims priority, application Canada, Dec. 22, 1971, 130879
Int. Cl.² C08L 29/04, 31/04, 39/06, 91/00
U.S. Cl. 428—323 28 Claims



1. A composition, which on drying on a substrate forms a pressure- and heat sensitive coating comprising (a) meldable organic particles consisting of a mixture of stearic acid and hydroxystearic acid of about 0.001 to 50 micrometers in diameter, said particles being formed by precipitation from a solvent and having a melting point above about 55°C, the particles being of substantially uniform colour, that will provide a visible change from a light to a darker colour, when subjected to plastic flow or deformation by heat or pressure, (b) a liquid carrier, being a poor solvent for the organic particles at least at room temperature, in sufficient amount to give a fluid system, and (c) a binder, dispersed or dissolved in the carrier to provide adhesion for the organic particles to a substrate without decreasing the pressure or heat deformability of the organic particles.

3,967,035

COATED CEMENTED CARBIDE PRODUCT

Thomas Eugene Hale, Warren, Mich., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 339,653, March 12, 1973, Pat. No. 3,914,473, which is a division of Ser. No. 147,240, May 26, 1971, Pat. No. 3,736,107. This application May 15, 1975, Ser. No. 577,804

The portion of the term of this patent subsequent to May 29, 1990, has been disclaimed.

Int. Cl.[2] C23C *11/08*

U.S. Cl. 428—336 3 Claims

1. The product prepared by the process of coating a cemented carbide substrate with a fully dense alpha aluminum oxide coating of from 1–20 microns thickness, which process comprises contacting the carbide substrate with aluminum halide vapor, water vapor and hydrogen gas (over the carbide substrate) at a temperature of from about 900° – 1250°C, the ratio of water vapor to hydrogen gas being between about 0.025 and 2.0, to form a layer of fully dense alpha aluminum oxide on said substrate.

3,967,036

FLUX-COATED ARC WELDING ELECTRODE

Edward Peter Sadowski, Ringwood, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed July 11, 1974, Ser. No. 487,780

Int. Cl.[2] B32B *9/00, 15/18*

U.S. Cl. 428—386 4 Claims

1. A flux-coated arc welding electrode consisting essentially of a metal electrode and a welding flux bonded as a coating on the electrode, said electrode being a maraging stainless steel consisting essentially of up to 0.05% carbon, 6.5% to 8% nickel, 9.5% to 11.5% chromium, 0.5% to 0.9% silicon, up to 1% molybdenum, up to 0.1% manganese, up to 0.1% aluminum, up to 0.1% titanium, up to 0.01% sulfur, up to 0.015% phosphorus and balance iron, said welding flux consisting essentially of the baked residue from a flux mixture consisting essentially of about 21% to 35% calcium carbonate, 20% to 26% cryolite, 21% to 35% titania, 2% to 4% bentonite, 3.5% to 7.7% chromium as ferrochromium, 2½% to 5% manganese combined in material selected from the group consisting of ferromanganese, manganese carbonate and mixtures thereof proportioned according to the relationship (%Mn as FeMn)+½(%Mn as $MNCO_3$) equal about 2½% to about 5%, and with the sum of $\%MnCO_3$ plus $\%CaCO_3$ not exceeding about 44% and the sum of $\%MnCO_3$ plus $\%TiO_3$ not exceeding about 42%, and an addition of liquid silicate selected from the group consisting of sodium silicate and potassium silicate and mixtures thereof in an amount effective as a binder, with the proportion of baked flux weight to electrode metal weight being at least 0.3 to one and not exceeding about 0.4 to one, said flux-coated electrode being characterized by capability for providing a weld deposit wherein the manganese content does not exceed 0.85% manganese.

3,967,037

FRICTION MATERIAL FOR BRAKE LININGS AND THE LIKE

Alfred Marzocchi; Albert E. Jannarelli, both of Cumberland, R.I., and David W. Garrett, Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 12, 1974, Ser. No. 460,628

Int. Cl.[2] B32B *5/16;* F16D *13/60*

U.S. Cl. 428—392 9 Claims

1. A friction material suitable for use in brake linings or pads, comprising from 30 to 60 percent by weight of randomly orientated glass fibers, from about 12 to 20 percent by weight of a resinous binder selected from the group consisting of a thermoset phenolic resin and aniline-formaldehyde resin, from about 2 to 8 percent by weight of a binder-modifying material selected from the group consisting of the carbonates and hydroxides of calcium, barium and aluminum, tetralkyl silicates and alkyl siloxanes wherein the alkyl groups, in both cases, have from 1 to 4 carbon atoms, and aromatic silicates and siloxanes having a hydroxy function, from about 5 to 20 percent by weight of a particulate heat-conducting material, from about 2 to 5 percent by weight of an elastomer, from about 5 to 15 percent by weight of a particulate filler, and from 5 to 15 percent by weight of a friction-modifying material.

3,967,038

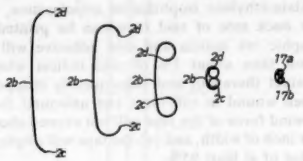
UNTWISTED SYNTHETIC RESIN STRING AND APPARATUS FOR MANUFACTURING THE STRING

Fusao Katagi, Sakai, Japan, assignor to Katagi Goseikagaku Kabushiki Kaisha, Sakai, Japan

Filed Oct. 22, 1974, Ser. No. 516,958

Int. Cl.[2] B32B *3/04;* D02G *3/00*

U.S. Cl. 428—397 3 Claims



1. An untwisted synthetic resin string, consisting essentially of a longitudinally stretched polyolefin resin film including two rolled portions, each spiral in cross section, formed by rolling the opposite side edges of the film toward each other, the rolled portions being parallel to each other in the longitudinal direction, wherein said rolled portions contact each other and only the outermost peripheral layers of the rolled portions which are in contact are thermally fused together, and the interior spirally rolled layers of each rolled portion are in loose contact with adjacent layers.

3,967,039

COATED ALKALI METAL CHLORITE PARTICLES

Leon Ninane, Bierges, and Willy Kegelart, Brussels, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Apr. 17, 1973, Ser. No. 352,048

Claims priority, application Belgium, May 4, 1972, 117080

Int. Cl.[2] B32B *9/00*

U.S. Cl. 428—403 9 Claims

1. An alkali metal chlorite-containing product comprising (*a*) alkali metal chlorite-containing particles and (*b*) a coating on said particles, said coating being an inorganic salt selected from the group consisting of sodium nitrate, sodium carbonate, sodium bicarbonate, sodium phosphate, sodium silicate, sodium chloride, potassium nitrate, potassium carbonate, potassium bicarbonate, potassium phosphate, potassium silicate, potassium chloride and mixtures thereof.

3,967,040

PRODUCTION OF COLORED GLASS BODIES

Émile Plumat, Gilly; Jean Schottey, Montignies-sur-Sambre, and Francois Toussaint, Montignies le Tilleul, all of Belgium, assignors to Glaverbel-Mecaniver, Watermael-Boitsfort, Belgium

Continuation of Ser. No. 293,033, Sept. 28, 1972, abandoned. This application Dec. 18, 1974, Ser. No. 534,137

Claims priority, application Luxembourg, Oct. 1, 1971, 63992

Int. Cl.[2] C03C *21/00*

U.S. Cl. 428—410 18 Claims

1. A process for imparting a desired coloration to a body of ordinary soda-lime-silica glass which is free of phosphorus pentoxide and formed from a vitrifiable composition, by dif-

fusing a substance into surface layers of the body from a medium contacting the body, comprising the steps of:

introducing a reducing agent into such surface layers by diffusion starting from the outer surface of the body, to cause such agent to be concentrated in such layers in an amount of at least 1% by weight;

placing the body surface, after said step of introducing, into contact with such a medium composed of a mixture of (*a*) a salt furnishing reducible silver metal ions in an amount sufficient to impart coloration to the body, and capable of being reduced by the reducing agent and (*b*) a diluting agent constituted by a salt of another metal, furnishing metal ions which diffuse into the body in exchange for smaller ions initially present in the body, the total concentration in the medium of the salt furnishing reducible silver metal ions being less than one hundred parts per million; and

during said step of placing, maintaining the surface layers at a temperature which causes such reducible silver metal ions to diffuse into the body surface layers and to be chemically reduced by the reducing agent and such ion exchange to induce in surface layers of the body compressive stresses which are prevented from relaxing entirely during the course of said step of placing, said diffusion of reducible silver metal ions and said ion exchange occurring similtaneously.

3,967,041
MODIFYING TEXTILES AND FIBERS

Heinz Abel, Reinach, Switzerland; Bryan Dobinson; George Edward Green, both of Cambridge, England; Melvin Harris, Dornach, Switzerland; Bernard Peter Stark, and Kenneth Winterbottom, both of Cambridge, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 30, 1973, Ser. No. 392,921

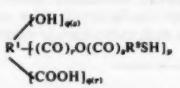
Claims priority, application United Kingdom, Sept. 1, 1972, 40647/72

Int. Cl.² B32B *27/06, 27/32*

U.S. Cl. 428—419 **18 Claims**

1. A process for imparting shrink-proof and durable press properties to keratinous material which comprises

1. treating the material with a polythiol ester of the formula



where

R^1 represents an aliphatic or araliphatic hydrocarbon radical of at least 2 carbon atoms, or an aliphatic or araliphatic hydrocarbon radical of at least 2 carbon atoms which contains one ether oxygen atom,

R^2 represents an alkylene group of at most 6 carbon atoms,

p is an integer of from 2 to 6,

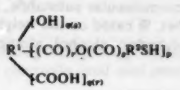
q is zero or a positive integer of at most 3, such that $(p+q)$ is at most 6, and

r and s each represent zero or 1 but are not the same, and

2. causing the polythiol ester to cure on the material by reaction with a polyene having a molecular weight of at least 250 and at most 10000 and containing, per average molecule, at least two ethylenic double bonds each β to an oxygen or nitrogen atom,

the sum of such ethylenic double bonds in the polyene and of the mercaptan groups in the polythiol ester being more than 4 and at most 8, the combined weight of the polyene and the polythiol ester being from 0.5 to 15% by weight of the keratinous material treated, and the amount of the polyene being such as to supply up to 1.2 ethylenic double bonds per mercaptan group of the polythiol ester.

12. Keratinous material bearing thereon 0.5 to 15% by weight, calculated on the weight of the keratinous material, of a cured product comprising a polythiol ester of the formula



where

R^1 represents an aliphatic or araliphatic hydrocarbon radical of at least 2 carbon atoms, or an aliphatic or araliphatic hydrocarbon radical of at least 2 carbon atoms which contains one ether oxygen atom,

R^2 represents an alkylene group of at most 6 carbon atoms,

p is an integer of from 2 to 6,

q is zero or a positive integer of at most 3, such that $(p+q)$ is at most 6, and

r and s each represent zero or 1 but are not the same, and a polyene having a molecular weight of at least 250 and at most 10000 and containing, per average molecule, at least two ethylenic double bonds each β to an oxygen or nitrogen, atom, the sum of such ethylenic double bonds in the polyene and of the mercaptan groups in the polythiol ester being more than 4 and at most 8.

3,967,042
FUSER BLANKET

Harold B. Laskin, New Brighton, and Robert H. Valentine, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 12, 1973, Ser. No. 322,915

Int. Cl.² B32B *27/00*

U.S. Cl. 428—422 **7 Claims**

1. A composite article suitable for use as a fuser blanket comprising a dimensionally-stable substrate having bonded to one surface thereof a thin, resiliently compressible layer comprising a fluorinated elastomer, and overlying said fluorinated elastomer and bonded thereto a thin, resiliently compressible layer comprising a silicone elastomer, said silicone elastomer having a release value of less than 100 grams per inch.

2. The article of claim 1 wherein said fluorinated elastomer is a fluorosilicone elastomer.

3,967,043
ASBESTOS ARTICLES HAVING DUSTPROOF PROPERTIES

Takashi Otouma, Yokohama, and Michio Nakamura, Odawara, both of Japan, assignors to Nippon Asbestos Company, Ltd., Tokyo, Japan

Filed Jan. 3, 1974, Ser. No. 430,590

Claims priority, application Japan, Mar. 26, 1973, 48-34299

Int. Cl.² B32B *19/02*

U.S. Cl. 428—443 **2 Claims**

1. An asbestos product which exhibits dustproof effects comprising an asbestos article impregnated in the interior substrate thereof by the reaction product of formaldehyde and a water-soluble organic compound reacted therewith to form a water-insoluble compound under weakly alkaline conditions in an atmosphere maintained at a high temperature and a high humidity, said reaction product being present in an amount of 0.05 to 10 wt.% based on the total weight of the asbestos product, said asbestos product having a surface layer of 0.04 to 0.09 wt.% based on the weight of the said asbestos product

of a film of a water-soluble macromolecular substance, said asbestos product having 1.5 – 30wt. % based on the weight of the asbestos product of a polyhydric alcohol plasticizer therein.

3,967,044

COPPER COATINGS ON SHAPED PLASTIC SUPPORTS

Wilhelm Brandt, Wertach, and Irmgard Bindrum, Wiesbaden-Biebrich, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 312,269, Dec. 5, 1972. This application June 26, 1975, Ser. No. 591,557

Claims priority, application Germany, Dec. 8, 1971, 2160822

Int. Cl.² B05D *5/12*

U.S. Cl. 428—457 4 Claims

1. A process for metallizing the surface of a shaped plastic support selected from the group consisting of polyesters, polyolefins, polyimides and acrylonitrile-butadiene-styrene copolymers comprising

producing on said surface a conductive layer of a surface resistance in the range of about 1 to less than 10^{12} ohms by incorporation of carbon black into said surface in an amount sufficient to obtain a surface resistance in the stated range,

and vapor depositing copper in a high vacuum on said conductive surface to form a coating on the shaped plastic support.

3,967,045

PRE-COATED METAL SHEET

Moriji Kurobe; Toshimi Araga; Nobuhiro Ito, all of Nagoya; Shigeyuki Sato, Iwakura, and Hidero Takahashi, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed July 3, 1974, Ser. No. 485,592

Claims priority, application Japan, July 5, 1973, 48-76277

Int. Cl.² B32B *15/08, 27/30*

U.S. Cl. 428—463 7 Claims

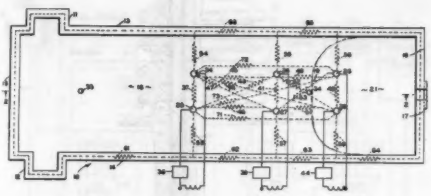
1. In a precoated metal sheet comprising a metal sheet and an acrylic resin coating, the improvement which comprises an acrylic resin coating comprising a dispersion of a granular rubbery material in an acrylic-based resin matrix which resin matrix contains monomer units having functional groups which cross-link upon heating and which resin matrix is glassy at room temperature, said resin coating comprising from 70 to 99 wt. percent of said acrylic-based resin matrix and from 1 to 30 wt. percent of said granular rubbery material.

ELECTRICAL

3,967,046
APPARATUS AND METHOD FOR INCREASING FURNACE LIFE IN AN ELECTRIC FURNACE FOR THERMOPLASTIC MATERIALS

Magnus L. Froberg, Granville, and John F. Maddux, Heath, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 18, 1975, Ser. No. 550,809
Int. Cl.² C03B 5/02
U.S. Cl. 13—6 **19 Claims**



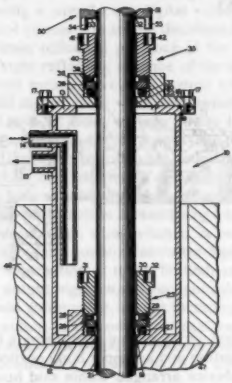
1. A system for heating molten thermoplastic material by Joule effect comprising a container for the molten thermoplastic material; sidewalls for said container having an electrical resistivity less than the electrical resistivity of such molten thermoplastic material at the operating temperatures of the system; an array of electrodes in said container having portions adapted for contact with such material, certain of said electrodes being mated; and means for applying electrical power to such material through said electrodes for heating such material by the Joule effect, said source being so applied as to impose the greatest voltage across said thermoplastic material between mated electrodes; said electrodes being so positioned with respect to said sidewalls and each other that the mated electrodes having the greatest voltage applied across such thermoplastic material between said electrodes are closer to each other than to the most proximate sidewall.

3,967,047
ELECTRODE COOLING APPARATUS

James Michael Long, Corvallis, and Paul Alan Osterlund, Philomath, both of Oreg., assignors to Evans Products Company, Portland, Oreg.

Filed Aug. 19, 1975, Ser. No. 605,867
Int. Cl.² C03B 5/02
U.S. Cl. 13—6 **4 Claims**

1. In an electric furnace, the combination comprising an electrode, electrode cooling apparatus, and associated tooling; said electrode cooling apparatus having a body, coolant inlet and outlet ports in said body, and a top and bottom to said body; a removable lid secured to said top, electrode receiving openings in said bottom and said lid, and an electrode passing through said electrode receiving openings; an inner sealing assembly located about the electrode and electrode receiving opening in the bottom of said body and an outer sealing assembly located about the electrode and electrode receiving opening in the lid, said inner and outer sealing assemblies comprising a female member, compressible sealing material in said female member and a male member adapted to be received by said female member in a position to compress said compressible sealing material at its inner reach within said female member, said male member having tool receiving means located on the outer face thereof; and associated tool means having an electrode receiving passageway extending therethrough whereby said tool may be slipped over said electrode, and tool receiver engaging means located on

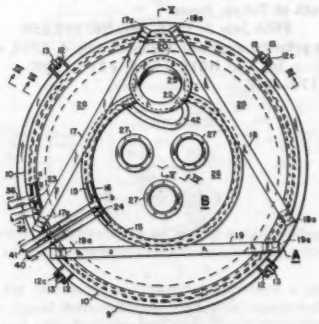


the inner end of said tool means adapted to engage said tool receiving means on the outer face of said male member.

3,967,048
DUAL RING SUPPORTED ROOF FOR ELECTRIC ARC FURNACE

Levi S. Longenecker, 61 Mayfair Drive, Pittsburgh, Pa. 15228

Filed June 6, 1975, Ser. No. 584,631
Int. Cl.² F27D 1/02
U.S. Cl. 13—35 **20 Claims**



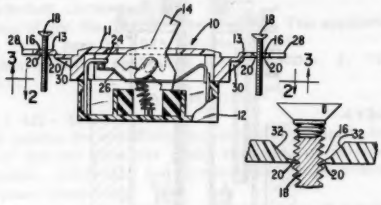
1. In an improved roof for an electric arc furnace and the like having a mouth ledge portion and wherein the roof is to be lowered and lifted into and out of position with respect to the ledge portion of the furnace, an outer fluid-cooled metal roof ring member adapted to rest on the ledge portion, an inner metal roof ring member in a radially-inwardly spaced relation with respect to said outer ring member, a first group of refractory tile members defining a central roof within the confines of and supported by said inner ring member, said central roof having electrode and fume exhaust hole portions therein, a second group of refractory tile members defining a roof skirt positioned between said inner and outer ring members, an overhead structural metal frame extending over the first and second groups of tile members and securing said inner ring member in an upwardly offset and connected relation with respect to said outer ring member.

3,967,049

MOUNTING STRAP

Burkhard A. Brandt, Santa Monica, Calif., assignor to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed Feb. 27, 1975, Ser. No. 553,679
Int. Cl.² H02G 3/08
U.S. Cl. 174—53 6 Claims



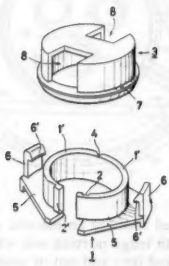
1. An electrical wiring device comprising a housing having a lower body portion and an upper body portion, components of said wiring device arranged within said housing, a plastic mounting strap means on one of said body portions and projecting laterally therefrom and having bevelled apertures at either end thereof receiving threaded screw means for mounting said strap means on a mounting surface with said wiring device projecting thereinto, said bevelled apertures being transversely elongated and having resilient lips engaging said threaded screw means to prevent free movement thereof.

3,967,050

STRAIN GROMMET

Chiharu Makihara, Kamakura, and Tohru Yoda, Yokohama, both of Japan, assignors to Mitsubishi Electric Co. and Nifco Inc., both of Tokyo, Japan

Filed July 3, 1975, Ser. No. 592,850
Claims priority, application Japan, July 4, 1974, 49-78191
Int. Cl.² H01R 13/58; F21V 21/02
U.S. Cl. 174—135 8 Claims



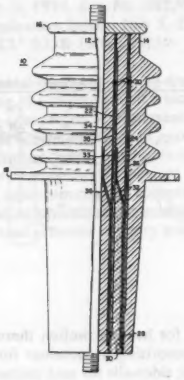
1. A two-piece strain relief grommet comprising a generally cylindrical body adapted to encircle a free end portion of a covered electrical cord, said body having one side split in an axial direction and means for permitting said body to flex between open and closed positions, fastening means for maintaining said split side in a closed position, a hollow hat-shaped fitting body accepting said cylindrical body within its cavity, connecting means for mantaining said bodies in telescoped assembled relation, and means providing communication with the interior of said fitting body.

3,967,051

CAST RESIN CAPACITOR BUSHING HAVING SPACER MEMBERS BETWEEN THE CAPACITOR SECTIONS AND METHOD OF MAKING SAME

Curtis L. Moore, Sharon, and Paul W. Martincic, Sharpsville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 22, 1975, Ser. No. 579,757
Int. Cl.² H01B 17/28
U.S. Cl. 174—143 7 Claims



1. An electrical bushing comprising:
a current conducting structure;
a solid insulating material cast around the conducting structure;
a first cylindrical capacitor element concentrically located around the conducting structure and embedded in the solid insulating material;
a second cylindrical capacitor element concentrically located around the first capacitor element and embedded in the solid insulating material; and
a spacing member constructed of a non-conductive material which is positioned between the first and second capacitor elements;
each of said capacitor elements including a conductive member and a non-conductive member;
said spacing member being constructed of a different material than said solid insulating material; and
said spacing member having a conical portion which has a first diameter at one end and a second diameter at the other end, with the first diameter being substantially equal to the outside diameter of the first capacitor element and the second diameter being substantially equal to the inside diameter of the second capacitor element.

7. A method of constructing a cast capacitor bushing comprising the steps of:
winding a first sheet of adhesive coated, non-conductive material around a tapered mandrel;
placing a sleeve around the smaller diameter portion of the tapered mandrel and the portion of the nonconductive material which is wound around the smaller diameter portion of the tapered mandrel;
winding a second sheet of adhesive coated, non-conductive material around the first sheet of adhesive coated, non-conductive material and said sleeve;
winding an adhesive coated, metallic foil around the second sheet of adhesive coated, non-conductive material;
curing the adhesive coating on the first and second sheets of non-conductive materials and on the metallic foil to provide a rigid capacitor section;

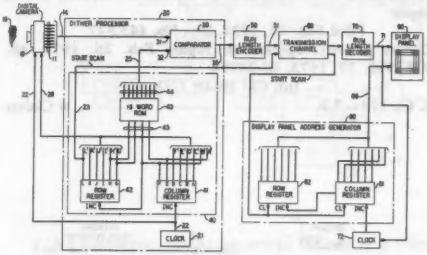
removing the sleeve from the mandrel;
removing the capacitor section from the mandrel;
assembling the capacitor section concentrically with other similar capacitor sections;
placing the capacitor sections into a mold and around a current conducting structure;
injecting an epoxy resin into the mold; and
curing the epoxy resin.

3,967,052

IMAGE TRANSMISSION METHOD AND APPARATUS

Charles Norris Judice, Lincroft, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 17, 1975, Ser. No. 596,954
Int. Cl.² H04N 7/12
U.S. Cl. 178—6 **32 Claims**



1. In a display system adapted to receive a signal representing the respective intensities of picture elements of a scanned image, said picture elements having respective assigned threshold values and said display system including means responsive to said signal for generating a plurality of display bits, the value of each display bit being determined by the intensity of a corresponding one of said picture elements and the threshold value assigned to said corresponding one of said picture elements, a generating means characterized by means for assembling said display bits in respective groups, each of said groups comprising ones of said display bits corresponding to picture elements having substantially equal assigned threshold values.

3,967,053

METHOD AND MEANS FOR ELECTRONIC IMAGE ANALYSIS WITHIN A RASTER-SCANNED FIELD

Rudolf Grosskopf, Koenigsbronn, Germany, assignor to Carl Zeiss-Stiftung, Wurttemberg, Germany

Filed Oct. 30, 1974, Ser. No. 519,202
Claims priority, application Germany, Nov. 2, 1973, 2354769
Int. Cl.² H04N 7/18
U.S. Cl. 178—6.8 **12 Claims**

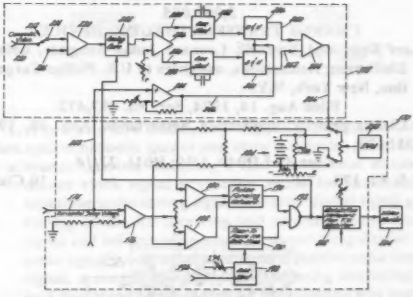
8. Apparatus for electronic-image analysis within a field of raster-scanned subject matter, wherein TV-scan video and line-synchronizing signals are available from raster-scanning of the subject matter, comprising a high frequency generator of frequency greater than the line frequency of TV-scanning, said generator having a synchronizing input for synchronization with input line-synchronizing signals, whereby for each scanning line a plurality of precisely spaced raster elements may be identified through output oscillations of said generator, a discriminator having an input for supply with the TV-scanned video signal, said discriminator having upper and lower thresholds between which a predetermined range of video-signal level may be selected for evaluation, decision-logic circuit means connected to said discriminator to receive signals passed between said thresholds, a synchronizing control connection from said generator to said logic-circuit means; said logic-circuit means including selectively operable means for storing a preselected digital value, switch means having a control connection to the discriminator output and having a first state reflecting presence of the scanned object and a second state reflecting absence of the scanned object, said logic-circuit means having an output characterized by said preselected digital value when said switch is in said second state; and $n-1$ bit delay-storage device having an input connected to said logic-circuit output and having a delay output connection, subtraction means connected to said delay output connection for subtracting one digit for each raster-digit signal, as long as said switch means is in said first state, the output of said subtraction means being connected to said logic-circuit output when said switch is in said first state, a comparator preset for a guide-value raster-digit signal beyond which further subtraction is to be limited, said comparator producing an output signal upon recognition of raster-digit reduction to said guide value, means including a gate having an input connection to the output of said comparator, said gate providing an output singal for particle evaluation, and an input control connection to said gate from the output of said discriminator.

3,967,054

TELEVISION MEASURING SYSTEM AND METHOD

Joe W. Walton, Goleta, Calif., assignor to Circon Corporation, Santa Barbara, Calif.

Filed May 8, 1975, Ser. No. 575,830
Int. Cl.² H04N 7/18
U.S. Cl. 178—6.8 **10 Claims**



1. A system for generating an analog output voltage representative of the dimensional measurement of an article comprising

means for televising said object to produce a composite video signal thereof having horizontal synchronizing signals and video information signal, said televising means including means for generating a horizontal sweep voltage which controls the video signal during each horizontal line scan occurring between successive horizontal synchronizing signals;

amplifying means electrically connected to the televising means and responsive to said composite video signal for producing an amplified composite video signal;

gating means responsive to said amplified composite video signal and to a selected number of gating pulses for enabling transmission of a plurality of increments of horizontal line scan video information signals;

boundary determination means responsive to the horizontal sweep voltage and having a horizontal position set means for establishing the horizontal component of the field of view of an object to be measured and a vertical position set means for establishing the vertical component field of

view of the object to be measured, said horizontal and vertical components of fields of view being slightly larger than the horizontal and vertical components of the dimensional measurement of the object to be measured;

horizontal line scan gating means responsive to said horizontal sweep voltage, said horizontal position set means and said vertical position set means for generating said selected number of gating pulses each having a duration equal to that increment of a horizontal line scan defined by the horizontal component of the field of view and the selected number of gating pulses being determined by vertical component of the field of view;

means responsive to said predetermined number of gated horizontal line scan video information signals for generating during each horizontal line scan a first control signal when the video information signal is at a first preselected level representative of one boundary of the dimensional measurement and a second control signal when the video information signal is at a second preselected level representative of the other boundary of the dimensional measurement;

means electrically connected to said control signal means and responsive to the horizontal sweep voltage for detecting and storing as a first signal and a second signal the average voltage level of said horizontal sweep voltages at each increment during the predetermined number of line scans when said first control signals and said second control signals are generated; and

output generating means electrically connected to said storing means and responsive to the first signal and second signal stored therein for generating an analog output voltage derived from the difference between the voltage levels of said horizontal sweep voltage represented by said stored first signal and second signal, which analog output voltage represents the dimensional measurement of an article.

3,967,055

CHARGE TRANSFER IMAGING DEVICE

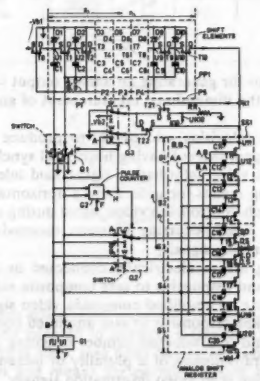
Kees Teer, and Frederik Leonard Johan Sangster, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 14, 1974, Ser. No. 497,472

Claims priority, application Netherlands, Aug. 20, 1973, 7311429

Int. Cl.² H04N 5/30; H01L 27/14

U.S. Cl. 178—7.1 **10 Claims**



1. A solid state photosensitive imaging array for detecting and shifting information by means of charge transfer comprising:

a shift register having a plurality of elements having an output, comprising photosensing means and shift means for sensing and transferring information;

a clock pulse means for providing clock pulses;

an analog shift register having an input/output terminal connected to the output of said register elements; and

control means responsive to said clock pulses for controlling the direction of shifting of said analog shift register.

3,967,056

AUTOMATIC FOCUSING APPARATUS

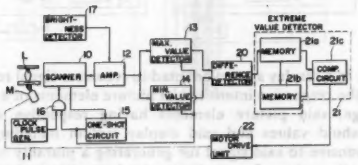
Kotaro Yata, Ikeda, and Seiji Yamada, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 19, 1974, Ser. No. 443,527

Claims priority, application Japan, Feb. 26, 1973, 48-22936; Feb. 27, 1973, 48-24994

Int. Cl.² H04N 5/38

U.S. Cl. 178—7.2 **4 Claims**



1. An apparatus for automatically focusing an image of a subject in an image plane, which is used for a photographic or television camera having an objective lens system, said apparatus comprising:

means for moving said lens system in predetermined incremental displacements;

a self-scanning photodiode array having a plurality of photodiodes arranged in said image plane so as to respectively generate an output corresponding to the brightness of a different part of the image;

shift registering means connected to said photodiodes for repeatedly picking up the outputs of said photodiodes in a predetermined order to generate a first electric signal representative of distribution of the brightness of the image of a predetermined range of spatial frequencies during each picking-up cycle thereof;

first detecting means for detecting maximum and minimum values of said first electric signal for each picking-up cycle of said shift registering means;

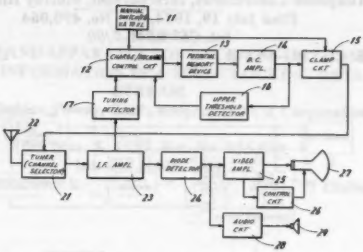
means for generating a second electric signal representative of the difference between said maximum and minimum values of said first electric signals which have been detected by said first detecting means for a series of picking-up cycles of said shift registering means, said second electric signal varying in its value in accordance with the position of said lens system; and

second detecting means for detecting the maximum value of said second electric signal for thereby indicating that said image is focused in said image plane thereof.

3,967,057
AUTOMATIC TUNING APPARATUS

Kazuyoshi Tsukamoto, Hirakata; Yoshiaki Sakauchi, Nara; Yukio Saito, Higashiosaka, and Kazufumi Ushijima, Hirakata, all of Japan, assignors to Sanyo Electric Co., Japan

Filed Jan. 25, 1974, Ser. No. 436,534
Claims priority, application Japan, Aug. 30, 1973, 48-94759; Aug. 31, 1973, 48-98640; Sept. 10, 1973, 48-101956; Oct. 26, 1973, 48-120977
Int. Cl.² H04N 5/60; H04B 1/32; H03J 1/02; H04B 3/04
U.S. Cl. 178—5.8 A 22 Claims



1. An automatic, tuning apparatus for use in a television receiver, comprising:

a potential memory device exhibiting a terminal voltage changing as a function of the charging or discharging quantity of electricity supplied to said device by a flow of current therethrough selectively in a charging or discharging direction, respectively,

means for clamping the terminal voltage of the potential memory device including means for supplying a selected, fixed voltage and means for superposing the terminal voltage of the potential memory device on the said selected, fixed voltage to produce a combined, clamped voltage,

tuning means for said television receiver for generating a tuning frequency and comprising a voltage controlled variable reactance device and means for supplying a voltage associated with said combined, clamped voltage from said clamping means to said variable reactance device, whereby the tuning frequency output of said tuning means is controlled in accordance with said combined, clamped voltage,

means coupled to said tuning means for providing a signal indicative of the degree of tuning of said tuning means,

means connected to said potential memory device for supplying said flow of current therethrough to said potential memory device in a direction for selectively charging or discharging said potential memory device and correspondingly changing the terminal voltage thereof, thereby causing a change in the reactance of said voltage controlled reactance device and thus a scanning change in the tuning frequency of said tuning means in the corresponding selected direction, said current providing means controlling the extent of change of said terminal voltage and correspondingly the change of the associated voltage supplied to said voltage controlled variable reactance, for controlling the tuning frequency of said tuning means and receiving a desired, corresponding television channel,

means for enabling said current supplying means for initiating said scanning change in the tuning frequency of said channel selector

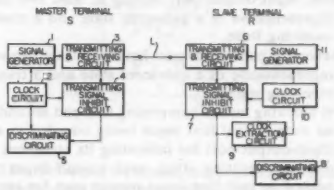
said television receiver including an intermediate frequency stage producing an intermediate frequency output including video component and sound component outputs and including means for separating synchronizing pulses from a received signal and producing a separated synchronizing pulse output,

means responsive to operation of said enabling means for starting charging or discharging or said potential memory device and thus said scanning change in the tuning frequency of said tuning means and responsive to said signal indicative of the degree of tuning of said tuning means, for disabling said current supplying means for discontinuing said charging and discharging of said potential memory device and correspondingly said scanning change in the tuning frequency of said tuning means of said potential memory device, said disabling means including at least two means responsive to at least two of said video component outputs, said sound component output and said synchronizing pulse output and means responsive to the simultaneous occurence of said at least two outputs for disabling said current providing means for discontinuing said scanning change in the tuning frequency of said tuning means.

3,967,058
TWO WIRES TIME SHARING TWO WAY FULL DUPLEX COMMUNICATION SYSTEM

Takao Moriya; Kazuo Murano, and Syunji Fujikawa, all of Kawasaki, Japan, assignors to Fujitsu Ltd., Japan

Filed Nov. 11, 1974, Ser. No. 522,693
Claims priority, application Japan, Nov. 12, 1973, 48-126923
Int. Cl.² H04L 5/14
U.S. Cl. 178—58 R 8 Claims



1. A two wire time sharing two-way full duplex communication system between master and slave terminals, comprising:

a master terminal including a first transformer means, a master clock signal generating means for generating a repetitive pulse timing signal, a master digital signal generating means for receiving said repetitive pulse timing signal and for providing a master transmitting dipolar RZ pulse signal synchronized with said repetitive pulse timing signal, a master transmitter means being connected to said first transformer means for transmitting said master transmitting pulse signal, and a master receiving means being connected to said first transformer means for receiving signals from said slave terminal and including a master discriminator means;

a slave terminal including a second transformer means, a slave receiving means being connected to said second transformer means for receiving and rectifying said master transmitting pulse signal, a slave clock extracting circuit means for extracting a slave timing signal from said received master transmitting pulse signal, a slave digital signal generating means for providing a dipolar RZ slave transmitting pulse synchronized with said slave timing signal, and slave transmitting means being connected to said second transformer means for transmitting said slave transmitting pulse signal;

a two wire transmission line means, a first end of which is connected to said first transformer means of said master terminal, and the second end of which is connected to said second transformer means of said slave terminal;

whereby, said master terminal and said slave terminal

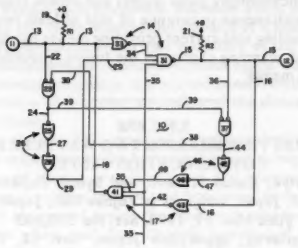
alternately transmit one bit of digital signal on said transmission line means to achieve simultaneous two way communication.

3,967,059

BI-DIRECTIONAL LOGIC SYSTEM

Harry W. Moore, III, Dryden, N.Y., and Richard R. McGee, Lakeland, Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 5, 1975, Ser. No. 547,156
Int. Cl.² H04L 5/16
U.S. Cl. 178—58 A 6 Claims



1. A fast acting bi-directional data transmission system comprising:

a first input-output port having at least two stable states representative of a quiescent state and a transmitting or receiving state,

a second input-output port having at least two stable states representative of a quiescent state and a transmitting or receiving state,

first blocking means comprising first and second inputs and an output, said first input being coupled to said second input-output port for indicating its quiescent state or its data transmitting state, said second input being connected to said first input-output port for receiving data signals and for generating a first delayed data signal at said output when said first input is indicative of a quiescent state,

second blocking gate means having first and second inputs and an output, said first input being coupled to said first input-output port for indicating its quiescent state or its data transmitting state, said second input being connected to said second input-output port for receiving data signals and for generating a second delayed data signal at said output when said first input is indicative of a quiescent state,

first drive means comprising a first drive gate delay and a first drive gate, said first drive gate having a first input connected to the output of said first drive gate delay and a second input coupled to the output of said first blocking gate means for receiving said first delayed data signal, said output of said first drive gate being connected to said second input-output port, wherein, data signals simultaneously applied to said first blocking gate and said drive gate delay are transmitted from said first drive gate means to said second input-output port when said second input-output port is in its quiescent state,

second drive means comprising a second drive gate delay and a second drive gate, said second drive gate having a first input connected to the output of said second drive gate delay and a second input coupled to the output of said second blocking gate means for receiving said second delayed data signal, said output of said second drive gate being connected to said first intput-output port, wherein, data signals simultaneously applied to said second blocking gate and said second drive gate delay are transmitted from said second drive gate means to said first input-output port when said first input-output port is in its quiescent state, whereby,

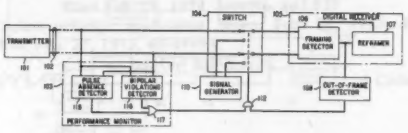
data signals applied to a transmitting port at either end of said bi-directional transmission line first automatically enables the drive means connected thereto, then disables the transmission of data signals from other end of said bi-directional transmission line and then transmits data signals from the transmitting port to the receiving port.

3,967,060

FAST REFRAMING ARRANGEMENT FOR DIGITAL TRANSMISSION SYSTEMS

Mahadevan Subramanian, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 19, 1974, Ser. No. 490,064
Int. Cl.² H04L 7/00
U.S. Cl. 178—69.5 R 13 Claims



1. In a digital receiver of the type including backward acting reframing apparatus and employed to receive digital signals transmitted at a prescribed bit rate and having a prescribed framing pattern, the improvement comprising:

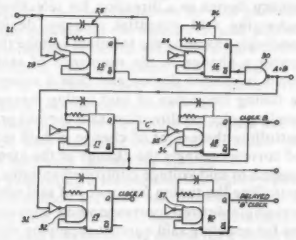
means for enhancing reframing of the digital receiver including, means for controllably inhibiting reception of incoming signals and for supplying a signal to the receiver during intervals in which reception is inhibited, said supplied signal having a frequency greater than the digital transmission rate and having an appropriate format related to the framing pattern of the transmitted digital signals normally being received so that the period of a reframing signal generated in the digital receiver is controlled to be substantially equal to but slightly less than the period of a frame of the transmitted signal normally being received.

3,967,061

METHOD AND APPARATUS FOR RECOVERING DATA AND CLOCK INFORMATION IN A SELF-CLOCKING DATA STREAM

Joseph J. Dobias, Poway, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Mar. 5, 1975, Ser. No. 555,518
Int. Cl.² H04L 7/00
U.S. Cl. 178—69.5 R 21 Claims



1. A method of recovering information from a self-clocking bi-phase coded bit stream, said bit stream having a predetermined bit period and two voltage levels with negative-going and positive-going voltage level transitions occurring in the

stream to indicate clock information and data information, one such voltage level transition occurring at the beginning of each bit period, the method comprising the steps of:

a. producing a first pulse for each positive-going and each negative-going voltage level transition in said bit stream;

b. producing a second pulse having a pulse width greater than one-half said bit period for each positive-going voltage level transition in each of said first pulses occurring at the beginning of a bit period; and

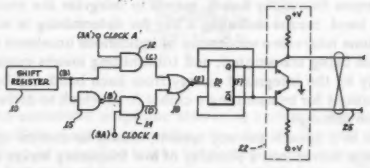
c. producing a clock pulse for each positive-going or negative-going voltage level transition of each of said second pulses.

3,967,062

METHOD AND APPARATUS FOR ENCODING DATA AND CLOCK INFORMATION IN A SELF-CLOCKING DATA STREAM

Joseph J. Dobias, Poway, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Mar. 5, 1975, Ser. No. 555,520
Int. Cl.² H04L 7/00
U.S. Cl. 178—69.5 R **7 Claims**



1. A method of encoding and transmitting binary information, represented by a wave form having a first voltage level during a bit period indicating one binary value and a second voltage level during a bit period indicating a second binary value, into a bi-phase self-clocking bit stream, comprising the steps of:

a. providing a first clock pulse train having a first pulse rate;

b. providing a second clock pulse train having a second pulse rate;

c. applying to a common terminal either said first clock pulse train when said wave form is at said first level during a bit period or said second clock pulse train when said wave form is at said second level during a bit period; and

d. providing an output wave form having two voltage levels and including two voltage level transitions during said bit period when said second clock pulse train occurs at said terminal and having a single voltage level transition during said bit period when said first clock pulse train occurs at said terminal.

3,967,063

LOGIC FOR MATRIX SYSTEMS FOR REPRODUCING QUADRAPHONIC SOUND

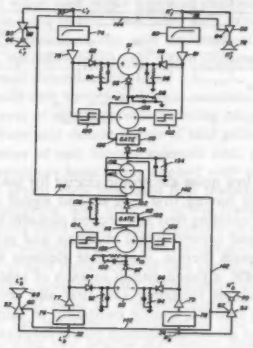
Benjamin B. Bauer, Stamford, Conn., assignor to CBS Inc., New York, N.Y.

Continuation of Ser. No. 351,938, April 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 177,003, Sept. 1, 1971, abandoned, and a continuation-in-part of Ser. No. 155,976, June 23, 1971, Pat. No. 3,798,373. This application Mar. 3, 1975, Ser. No. 554,422
Int. Cl.² H04R 5/00
U.S. Cl. 179—1 GQ **35 Claims**

1. Decoder apparatus for translating first and second composite signals L_T and R_T respectively containing, when present, dominant left front (L_f) and right front (R_f) signal components each including left back (L_b) and right back (R_b) signal components, when present, and wherein said L_b signal components have substantially equal magnitude and are in substantially quadrature relationship with each other in said first and second composite signals and in one is in leading relationship with that in the other and wherein said R_b signal components have substantially equal magnitude and are in substantially quadrature relationship with each other in said first and second composite signals and in one of said composite signals is in lagging relationship with that in the other, into four separate output signals respectively predominantly containing, when present, L_f, R_f, L_b and R_b signals, said apparatus comprising, in combination:

a decoding matrix having first and second input terminals to which said L_T and R_T composite signals are respectively applied, and first, second, third and fourth output terminals,

said matrix being operative to transfer substantially equal amounts of said L_f, R_f, L_b and R_b signal components, when present, as dominant signals to said first, second,



third and fourth output terminals, respectively said L_f and said R_f signals each being accompanied by lower amplitude, quadrature-related L_b and R_b signal components with the L_b and the R_b components accompanying the L_f and R_f signals also being in quadrature with each other, and said L_b and the R_b signals each being accompanied by lower amplitude, quadrature-related L_f and R_f signal components with the L_f and R_f signal components accompanying the L_b signal being in phase opposition to the R_f and L_f signal components accompanying the R_b signal;

first, second, third and fourth gain control amplifiers respectively connected to said first, second, third and fourth output terminals and each having input and output terminals and a control electrode,

said gain control amplifiers each having a gain characteristic which varies with the control voltage applied to its control electrode and being normally operative at a first quiescent control voltage level which produces a first amplification factor lower than its full amplification by a selected amount, and having a time constant to cause it to respond relatively less rapidly to application of a negative-going control voltage,

control circuit means connected to the output terminals of said decoding matrix and operative to compare the relative amplitudes and phase positions of the signals instantaneously present at said first, second, third and fourth output terminals and to produce a first control signal when the output signals at the third and fourth output terminals of the decoding matrix are of equal amplitude and out of phase or a second control signal when the output signals at the first and second output terminals of the decoding matrix are of equal amplitude and are out of phase, or both said first and second control signals,

means for applying said first control signal, if present, to the control electrodes of said first and second gain control amplifiers, and

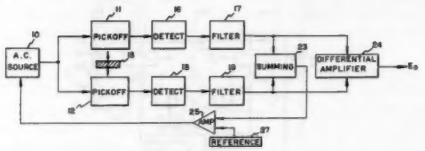
means for applying said second control signal, if present, to the control electrodes of said third and fourth gain control amplifiers.

3,967,064

LOW NOISE ELECTRONIC CIRCUIT, TRANSDUCER USING THE SAME, AND METHOD

Frederick J. Sigworth, Orinda, Calif., assignor to Systron Donner Corporation, Concord, Calif.

Continuation of Ser. No. 307,110, Nov. 16, 1972, abandoned.
This application Apr. 28, 1975, Ser. No. 572,267
Int. Cl.² H04R 3/00
U.S. Cl. 179—1 P 15 Claims



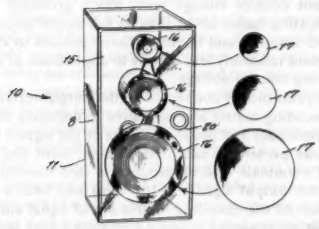
11. In a low noise electronic circuit for use with transducers of the type having first and second signal channels, an AC source for exciting first and second pickoffs located in each of said first and second signal channels and producing first and second signals therein, a movable element disposed between said pickoffs, a tuned circuit in each of said first and second signal channels including said first and second pickoffs for increasing said AC source excitation in said pickoffs limited only by the power dissipation characteristics of said pickoffs, means for detecting said first and second signals producing DC signals of predetermined polarity, said detecting means containing electronic circuit elements having no more than two electrical terminals, thereby minimizing injection of asynchronous noise into said channels, and means for combining said DC signals whereby common mode noise signals are cancelled and differential mode output signals are added.

3,967,065

PLEXIGLAS SPEAKERS

James M. Ward, deceased, late of Kansas City, Mo. (Sandra Ward, surviving spouse), assignor to Sandra Ward, Kansas City, Mo.

Filed July 21, 1975, Ser. No. 597,773
Int. Cl.² H04R 1/02
U.S. Cl. 179—1 E 5 Claims



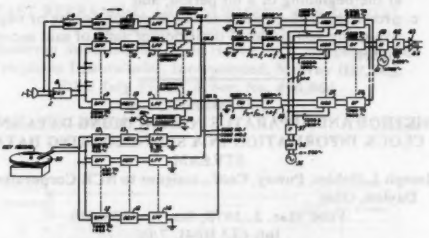
1. In a Plexiglas speaker unit the combination of a cabinet containing a plurality of speakers, means for connection of said speakers to exterior components of a high fidelity sound system.

3,967,066

SECRET TELEPHONY

Robert C. Mathes, Maplewood, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 24, 1941, Ser. No. 412054
Int. Cl.² H04K 1/02
U.S. Cl. 179—1.5 R 34 Claims



1. In a system of secret transmission of speech, means to subdivide speech waves constituting a message into a plurality of narrow frequency bands, means to integrate the energy in each band, means including a key for determining in successive time intervals a succession of indications unrelated to the speech being transmitted, and transmitting means controlled jointly by the integrated energy from each band and by said indications for transmitting a cipher from which to derive said speech message.

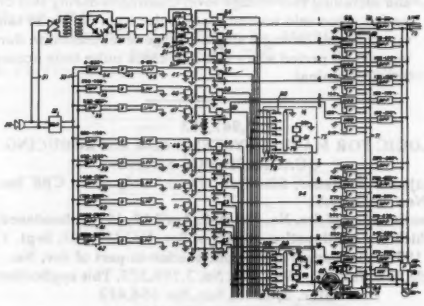
10. In a speech privacy system, means to analyze speech message waves into a plurality of low frequency waves simultaneously existent in a corresponding plurality of separate channels, and enciphering means for adding to each such low frequency wave a varying key wave of similar amplitude and frequency range to destroy the identity of the low frequency waves before transmission.

3,967,067

SECRET TELEPHONY

Ralph K. Potter, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 24, 1941, Ser. No. 412,056
Int. Cl.² H04K 1/02
U.S. Cl. 179—1.5 R 18 Claims



1. In a system of secret transmission of speech, means to subdivide speech waves constituting a message into a plurality of narrow frequency bands, means to integrate the energy in each band, means individual to said bands to subdivide the integrated energy from each band on a time basis to produce impulses with intervening spaces, and means to variably control said last-mentioned subdividing means individually in accordance with a key unrelated to the message.

3,967,068

AUTOMATIC TELEPHONE MONITORING SYSTEM

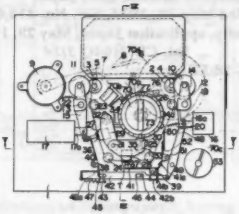
Isao Shinohara, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 380,130, July 17, 1973, abandoned. This application Feb. 11, 1975, Ser. No. 549,032

Claims priority, application Japan, July 17, 1972, 47-72283; Aug. 7, 1972, 47-78960; Aug. 7, 1972, 47-78961; Aug. 21, 1972, 47-83437; Aug. 21, 1972, 47-83438; Sept. 25, 1972, 47-96431; Dec. 20, 1972, 47-128573; Dec. 20, 1972, 47-128574; Mar. 12, 1973, 48-29190; Nov. 25, 1973, 48-135558; Nov. 24, 1972, 47-135719; Mar. 12, 1973, 48-30941

Int. Cl.[2] H04M *1/64*; G11B *21/08*, *5/55*

U.S. Cl. 179—6 R 7 Claims



1. An automatic telephone answering system comprising:

an endless magnetic recording tape having thereon a first group of recording tracks for recording and reproducing a first type of messages to be transmitted to a caller, a second group of recording tracks for recording and reproducing a second type of messages to the caller, and a third group of recording tracks for recording and reproducing messages from the caller, the numbers of said tracks of said first and second groups being equal, said tape having both ends joined to each other by a metallic foil secured thereto, thereby to make the tape endless;

means operatively positioned for driving said magnetic tape in one direction and comprising an electrically operated motor, a first solenoid unit having a solenoid armature movable between extended and retracted positions, a capstan, and a pinch roller operatively coupled to said solenoid armature, said capstan being rotated by said motor, and said pinch roller being selectively engaged to said capstan with the magnetic tape sandwiched therebetween, said tape being driven in said one direction by said capstan in cooperation with said pinch roller upon movement of said solenoid armature to said retracted position thereof;

a first movable selectively operable transducer head;

means operatively connected to said first transducer head for selectively aligning said first transducer head with any one of said tracks of said first group and for thereby permitting said first transducer head to record and reproduce information on said selected one of said tracks of said first group;

a second movable transducer head for recording and reproducing information on said second and third groups of tracks and operable when said first transducer head is inoperative;

means for stepwisely shifting said second transducer head in a first direction transversely of the lengthwise direction of said magnetic tape each time said first transducer head completes its operation to thereby align said second transducer head with said tracks of said third group one after another, and for, after all of the tracks of said third group have been used, aligning said second transducer head with one of the tracks of said second group which corresponds to said selected one of said tracks of said first group; said means for stepwisely shifting said second transducer head in said first direction comprising:

a stepped cam member;

a ratchet wheel coupled to said stepped cam member;

a trigger lever coupled to said ratchet wheel for driving said ratchet wheel;

a crank lever coupled to said trigger lever;

a pulley coupled to said crank lever;

a drive wheel;

transmission means coupled to said crank lever and to said drive wheel for transmitting driving force from said drive wheel to said pulley;

a first pivotable lever coupled to said transmission means for selectively activating said transmission means;

a seesaw lever coupled to said pivotable lever;

a roller element rotatably provided on one end of said seesaw lever;

a detent recess formed in said pulley, with driving force transmission from said drive wheel to said pulley being discontinued when said roller element engages said detent recess in said pulley, and with said driving force transmission means between said drive wheel and said pulley being operative when said roller element is disengaged from said detent recess;

a second solenoid unit having a plunger member;

said roller element of said seesaw lever being adapted to be disengaged from said detent recess of said pulley by said plunger member of said second solenoid unit; and

said second transducer head being aligned with said tracks of said third group each time said first transducer head completes operation, and after all of the tracks of said third group have been used, being aligned with one of the tracks of said second group which corresponds to said selected one of said tracks of said first group; and

means operatively positioned for stepwisely shifting said second transducer head in a second opposite direction transverse of the lengthwise direction of said magnetic tape for returning said second transducer head from a first position in which said second transducer head is aligned with said one of said tracks of said second group, to a second position in which said second transducer head is aligned with the first one of the tracks of said third group.

3,967,069

COMPATIBLE FOUR CHANNEL FM SYSTEM

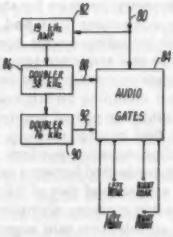
Louis Dorren, Millbrae, Calif., assignor to Matsushita Electric Corporation of America, Secaucus, N.J.

Continuation of Ser. No. 319,939, Dec. 29, 1972, Pat. No. 3,822,365, which is a continuation of Ser. No. 32,989, April 29, 1970, Pat. No. 3,708,623, which is a continuation-in-part of Ser. No. 13,902, Feb. 25, 1970, abandoned. This application June 24, 1974, Ser. No. 482,415

The portion of the term of this patent subsequent to Jan. 2, 1990, has been disclaimed.

Int. Cl.[3] H04H *5/00*

U.S. Cl. 179—15 BT 12 Claims



1. A four channel FM system comprising means for transmitting a carrier wave frequency-modulated in accordance with the modulating function:

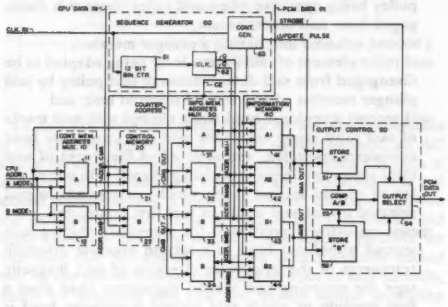
$C(t) = (A+B+C+D) + (A+B-C-D)\sin 2w_s t + (A-B-C+D)\cos 2w_s t + (A-B+C-D)\sin 4w_s t + K\sin w_s t$ in which A, B, C, D are audio signals, K is the amplitude of the reference pilot signal $\sin w_s t$, $w_s = 2\pi f_s$, where f_s is the fundamental frequency of the pilot signal, $\sin 2w_s t$, cosine $2w_s t$ and sine $4w_s t$ are sub-carrier signals, each sub-carrier signal being suppressed-carrier double sideband amplitude modulated by said audio signals, and receiver means operative in response to the reception of said frequency modulated carrier for reproducing each of said audio signals.

3,967,070

MEMORY OPERATION FOR 3-WAY COMMUNICATIONS

Dinesh K. Srivastava, Westmont, and David Q. Lee, Chicago, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Aug. 21, 1975, Ser. No. 606,698
Int. Cl.² H04J *3/00*
U.S. Cl. 179—15 AT **6 Claims**



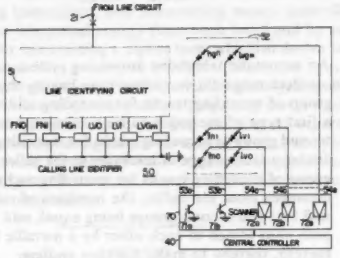
1. Memory means for use in a time division multiplex telephone switching system employing pulse code modulation, wherein said switching system operates under control of a connected central processor unit which generates control signals in accordance with an internal program and external call requests from a plurality of subscribers, said memory means comprising: a sequence generator including an input circuit connection to said central processor unit and a plurality of output connections, operating in response to cyclically recurring signals received from said central processor unit to generate a plurality of control signals; a control memory comprising first and second memory portions, each including circuit connections to said central processor unit and to said sequence generator; control memory multiplex means including first and second portions connected between said central processor unit and said control memory and including circuit connections to said sequence generator, operated in response to control signals from said sequence generator to selectively couple address information from said central processor unit to one of said control memory portions for storage therein; an information memory comprising first and second pairs of memory portions and including circuit connections to said switching system and to said sequence generator; information memory multiplex means comprising first and second pairs of multiplex portions and including circuit connections to said sequence generator; said first pair of multiplex portions connected between said first control memory portion and said first pair of information memory portions and said second multiplex portion pair connected between said second control memory portion and said second pair of information memory portions; said information memory multiplex means operated in response to cyclic signals from said sequence generator to couple information stored in said control memory portions to said information memory portions; and output control means including an output connection to said telephone switching system and circuit connections to said sequence generator and said information memory; said information memory operated in response to control information from said control memory coupled through said information address multiplexer, to store pulse code modulated data from said switching system, and in response to said sequence generator signals couple said coded data to said output control means; said control means periodically operated in response to said sequence generator to couple said data from said output control means to said telephone switching system.

3,967,071

SWITCHING SYSTEM OF STORED PROGRAM CONTROL TYPE

Hirotoshi Shirasu, and Hirotaka Usuda, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed May 28, 1974, Ser. No. 474,024
Claims priority, application Japan, May 28, 1973, 48-58694
Int. Cl.² H04Q *3/54*
U.S. Cl. 179—18 ES **7 Claims**



1. In a telephone switching system of the stored program control type having

a plurality of line circuits associated with a plurality of respective subscribers and capable of indicating the free status, the calling status, and the busy status of a subscriber's line;

a switching network having a plurality of terminal positions to be respectively connected with said line circuits; and

a stored program central controller;

the improvement comprising:

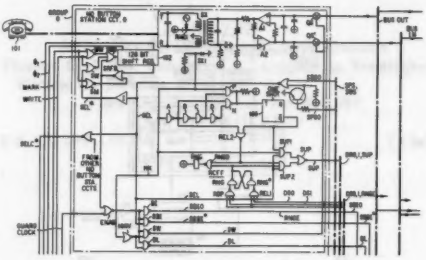
first means, coupled between said line circuits and said stored program controller, and responsive to a first signal from a line circuit, representative of the calling status of a subscriber, for supplying to said central controller an indication of the terminal position of a calling subscriber's line on said switching network; and

second means, coupled between said stored program controller and said line circuits, and being responsive to a signal from said central controller, corresponding to the terminal position of a called subscriber's line on said switching network and representative of a request for an incoming connection to said called subscriber's line, and a second signal, from the line circuit associated with said called subscriber's line, and representative of the busy status of said called subscriber's line, for supplying to said central controller an indication of the busy status of said called subscriber's line.

3,967,072
TIME DIVISION NETWORK CONNECTION AUDITING ARRANGEMENT

James Owen Dimmick; Theras Gordon Lewis; John Francis O'Neill, all of Boulder, Colo., and Lucian Philip Fabiano, Jr., Madrid, Spain, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 313,956, Dec. 11, 1972, abandoned. This application June 10, 1974, Ser. No. 478,147
Int. Cl.[2] H04M 3/20; H04Q 1/52
U.S. Cl. 179—18 J 10 Claims



1. In a time division switching system having a communications bus, a plurality of station ports and line ports, a central memory for indicating which ports are to be interconnected, and means defining a numbered sequence of time slots during which predetermined ones of said ports may be connected to said communicating bus, the combination comprising

first common bus means associated with said line ports and second common bus means associated with said station ports,

addressable means at each said station port and line port to cause the associated one of said common bus means to exhibit a particular signal condition during the time slot that said port is connected to said communications bus,

means for addressing said addressable means of a station and of a line port which said central memory indicates are to be interconnected,

means for storing an indication of the time slot numbers accruing when said particular signal condition is present on said first and on said second bus means,

means for assigning a new time slot number to said station and line port addressed by said addressing means when said time slot numbers accruing are different, and

means operative when said numbers agree for advancing said addressing means to address another pair of said station and line ports indicated in said memory.

3,967,073
PBX AUTOMATIC NUMBER IDENTIFICATION SYSTEM

Harold Peter Anderson, Boulder; George Albert Lesser, Lakewood, both of Colo.; Fredric Lukas, Chatsworth, Calif.; Rodney Robert Maxon, and James Hall Vlamour, both of Boulder, Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 9, 1975, Ser. No. 539,828
Int. Cl.[2] H04Q 3/72
U.S. Cl. 179—18 FH 13 Claims

1. In a telephone system having a PBX, a central office, and trunks interconnecting said PBX with said central office, said PBX comprising:

a switching network having lines connected to its line side and said trunks connected to its trunk side,

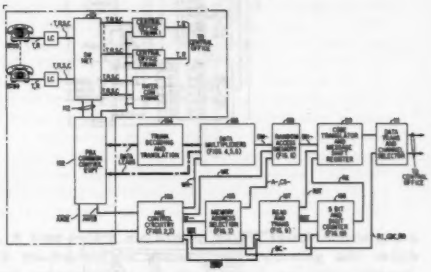
means responsive to the initiation of calls by a plurality of calling lines each requesting access to said central office for selecting a different idle one of said trunks for connection to each of said calling lines,

means responsive to each selection of an idle trunk on a call for identifying the calling line and the selected trunk for said call,

a memory having storage locations with a capacity for storing line and trunk identity information for a predetermined number of said calls,

means responsive to each identification by said identifying means on a call for entering the calling line and trunk identity information into vacant locations of said memory,

means including said memory for inhibiting said selecting means when said memory has reached its storage capacity and is unable to store additional call identity information,



means responsive to each identification by said identifying means when said selection means is not inhibited for establishing a network connection from each of said calling lines to its selected trunk,

a data channel interconnecting said PBX with said central office, and

means for transmitting said identify information in said memory over said data channel to said central office.

3,967,074
TELEPHONE STATION IDENTIFICATION SYSTEM

Robert Frederick Schillo, Granville, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 30, 1975, Ser. No. 591,892
Int. Cl.[2] H04M 15/06; H04Q 3/72
U.S. Cl. 179—18 FH 24 Claims

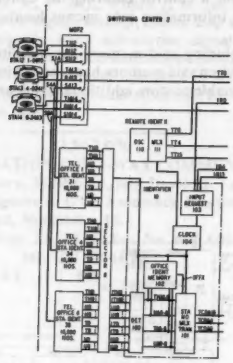
1. An identification system for use with telephone stations of a plurality of telephone offices comprising

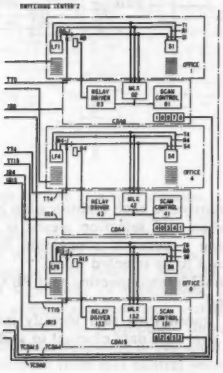
means having input and output leads and responsive to an input signal appearing on one of the input leads for translating the input signal into output signals on thousands, hundreds, tens, and units ones of the output leads,

means for identifying ones of the telephone offices currently serving telephone stations in accordance with a first output signal appearing on one of the thousands, hundreds, tens, and units output leads of said translating means, and

means for generating the identity of each telephone station

served by the identified telephone offices in accordance with subsequent output signals appearing on the thousands, hundreds, tens, and units output leads of said translating means.





3,967,075
ATTENDANT BOARD SYSTEM IN A TELEPHONE EXCHANGE

Hiromi Moriyama, Fujisawa, and Motosuke Kuwabara, Yokohama, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 15, 1974, Ser. No. 433,501
Claims priority, application Japan, Jan. 16, 1973, 48-6648
Int. Cl.² H04Q *3/62*
U.S. Cl. 179—98 **1 Claim**

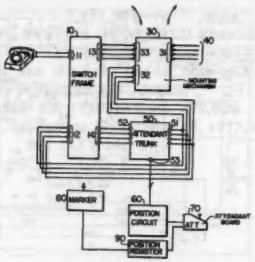
1. In an attendant board system in a telephone exchange which may be selectively adapted for either direct connection type office trunk communication or channel access type office trunk communication between a switch frame and an attendant trunk to a central office provided with:

a. a switch frame having two groups of trunk side terminals and a group of line side terminals;

b. an attendant trunk having switch frame side terminals and office trunk side terminals respectively connected with one group of each of the trunk side terminals and the line side terminals of the switch frame; and

c. an attendant board connected with an attendant trunk and controlling the operation thereof, wherein the improvement comprises:

d. an office trunk mounting mechanism having first connector means connected with an office line, second connector means connected with the trunk side terminals of the switch frame, and third connector means connected with the office trunk side terminals of the attendant trunk; and



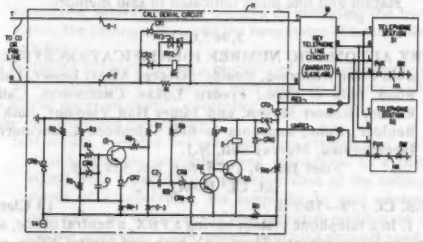
e. a first office trunk having a first office trunk circuit, and first and second connector means both connected therewith at the positions corresponding to the first and second connector means, respectively, of the office trunk mounting mechanism, for providing a channel access type attendant board system; and

f. a second office trunk having a second office trunk circuit, and first and second connector means both connected therewith at the positions corresponding to the first and third connector means of the office trunk mounting mechanism, for providing a direct connection type attendant board system.

3,967,076
CALL DENIAL CIRCUIT FOR KEY TELEPHONE SYSTEMS

Gerry Christian Balzer, Freehold, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 27, 1975, Ser. No. 562,573
Int. Cl.² H04M *1/66*
U.S. Cl. 179—99 **13 Claims**



1. A call denial circuit for use in a key telephone system wherein communication connections can be established between a telephone line and any number of telephone stations under control of a line circuit connected between said line and said stations, said line circuit being controllable by A lead signals from each said station, said call denial circuit arranged for connection to said telephone line and to the A lead of at least one of said stations and comprising

means for monitoring said telephone line to detect voltage polarity reversals with respect to said telephone line,

a first terminal connectable to the A lead from an associated station,

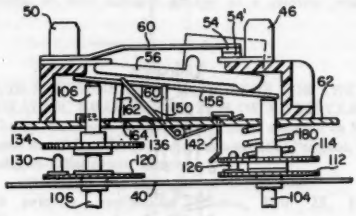
means operable under control of said monitoring means for denying communication transmission over said telephone line when said voltage polarity reversal is detected, and

means responsive to a first signal on said A lead when said A lead is connected to said first terminal for preventing the enabling of said denying means.

3,967,077
APPLIANCE TIMER SWITCH ASSEMBLY

Thomas G. Willis, Raleigh, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 2, 1974, Ser. No. 494,681
Int. Cl.² H01H *43/00*
U.S. Cl. 200—38 FA **7 Claims**



1. A timing device suitable for electric ranges, comprising:

a supporting plate having at least first, second and third openings therein;

an electrical contact structure having opened and closed positions and supported in fixed relationship with respect to the supporting plate;

a rocking lever supported from the supporting plate, said rocking lever having first and second ends positioned substantially over the first and second openings in the supporting plate and an ear projecting from the surface of said lever and positioned substantially over the third opening;

a first shaft extending through the first opening in the supporting plate and engageable with the first end of the rocking lever;

a second shaft extending through the second opening in the supporting plate and engageable with the second end of the rocking lever;

a motor-driven gear mechanism;

said first and second shafts being settable in automatic and manual positions to provide automatic control of the contacts according to the position of the motor-driven gear assembly and to provide manual control of the contacts which is nonresponsive to the position of the motor-driven gear assembly;

a locking lever pivotally attached to the supporting plate;

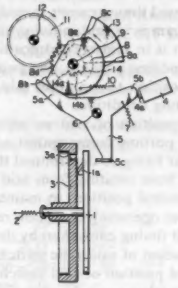
means for moving a portion of the locking lever across the third opening when the first and second shafts are set in the manual position; and,

means for moving the locking lever away from the third opening when the first and second shafts are set in the automatic position.

3,967,078
TIME SWITCH MECHANISM

Jyusuke Yaguinuma, Koriyama, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Oct. 29, 1974, Ser. No. 518,874
Claims priority, application Japan, Oct. 29, 1973, 48-125139[U]
Int. Cl.² H01H *43/10*; G04C *21/16*
U.S. Cl. 200—38 R **1 Claim**



1. A time switch mechanism having switch means and a clock mechanism for automatically operating said switch means independently of the manual operation thereof, wherein the improvement comprises:

a switch lever rotatable about a given axis between a start position and a terminal position and being spring-biased toward said terminal position;

said switch means being positioned adjacent to said switch lever so that said switch means is actuated to one operating condition thereof by a first portion of said switch lever when the same is positioned at either of said start position and said terminal position, while said switch means is switched to the other operating condition when said switch lever is positioned at an intermediate position between said start position and said terminal position;

a rotary switching cam manually rotatably mounted adjacent to said switch lever and having a first, a second and a third cam portion and a pin formed thereon, being spring-biased for rotation in a direction from an initial position at which said first cam portion faces against a second portion of said switch lever to a position in which said second portion faces against said second cam portion, then against said third cam portion and thereafter again against said first cam portion;

click stop means cooperating with said pin of said switching cam for releasably holding said switching cam, respectively, at a first position at which said second cam portion faces against said second switch lever portion after said switch cam is rotated from said initial position, at a second position at which said third cam portion faces against said second lever portion and at a third position at which said first cam portion faces again against said second lever portion;

a sector gear integrally secured to said switching cam so as to be rotatable therewith;

a gear frictionally mounted on a rotatable shaft driven by said clock mechanism and engageable with said sector gear so as to drive said sector gear in the direction of rotation of said switching cam, the configuration of said sector gear being so determined that it is disengaged from said gear within the range of rotation of said switching cam before said switching cam is brought into said initial position thereof during its rotation;

a time setting member having engaging means manually settable to a desired set time; and

a timing cam driven by said clock mechanism, being coaxially disposed with said time setting member, and having engaging means, said timing cam cooperating with said time setting member so that said timing cam is shifted from a first position to a second position at said set time by the engagement of said engaging means thereof with said engaging means of said time setting member during rotation of said timing cam, said timing cam being so positioned with respect to a third portion of said switch lever that the same is held in said intermediate position to maintain said switch means in said other operating condition when said timing cam is in said first position and said switching cam is in said initial position, while, when said timing cam is in said second position and said switching cam is in said first position, said switch lever is held in said terminal position to maintain said switch means in said one operating condition,

said second position of said switching cam at which said third cam portion faces against second portion of said switch lever being so determined that said switch lever is prevented from rotating from said intermediate position to said terminal position, to maintain said switch means in said other operating condition regardless of the operation of said timing cam, thereby determining a first manual set position of said time switch mechanism,

and said third position of said switching cam at which said first cam portion again faces against said second portion of said switch lever is so determined that said switch lever is held in said start position so as to maintain said switch means in said one operating condition with said third portion of said switch lever being spaced from said timing cam, thereby determining a second manual set position of said time switch mechanism, and

said initial position of said switching cam permitting automatic operation of said time switch mechanism.

3,967,079

COLLISION DETECTION DEVICE

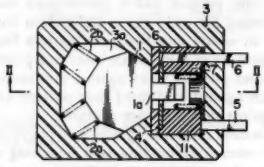
Hideaki Sasaya, and Akihiro Kobayashi, both of Aichi, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 3, 1975, Ser. No. 538,330

Claims priority, application Japan, Feb. 26, 1974, 49-23177

Int. Cl.² H01H *35/14, 1/06*

U.S. Cl. 200—61.45 R **3 Claims**



1. A collision detection device comprising:

a. a casing;

b. a mass disposed within said casing in such a way that said mass is deflected under acceleration or deceleration within a predetermined angle including the direction of the movement of the vehicle;

c. pressure means for pressing said mass;

d. a first fixed contact and a second fixed contact both fixed within said casing so as to be electrically isolated from each other;

e. a contact coil spring interposed between said first and second contacts in such a way that said contact spring can be deflected only in the direction of the movement of the vehicle when said mass is deflected, said contact spring having one end portion in contact with said second fixed contact; and

f. a column-shaped member fixed to said mass and extended through said first fixed contact to press said contact spring in the direction opposite to the direction of the movement of the vehicle, by the force of said pressure means, said column-shaped member having a stepped portion whose length one direction is smaller than the diameter of said contact spring, said stepped portion being normally brought into contact with a portion of another end of said contact spring so that the remaining portion of the same end of said contact spring, which is normally not in contact with said stepped portion can be brought into contact with said first fixed contact when said mass is deflected.

3,967,080

SWITCH DEVICE FOR INDICATING THE UNDUE OPENING OF DOORS AND CLOSING-WINGS

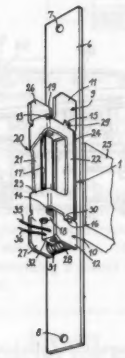
Deo Errani, Via Cavour 44/1, Faenza (Ravenna), Italy

Filed Aug. 12, 1974, Ser. No. 496,787

Claims priority, application Italy, Aug. 29, 1973, 3478/73

Int. Cl.² H01H *27/00, 3/16*

U.S. Cl. 200—61.64 **4 Claims**



1. An intrusion detector device for detecting the undue opening of a door comprising a plate member fixed to the door jamb and closing a cavity formed therein, an aperture formed in said plate member and adapted to receive a bolt of a lock or a pin mounted on said door adjacent said plate member means for supporting an alarm controlling switch mounted on said plate member and arranged in said cavity, said alarm controlling switch having normally open contacts, a swinging element for actuating said alarm controlling switch pivoted on said plate member and located in said cavity, spring means biasing said element to a rest position in which said contacts are open, said swinging element being adapted to be engaged by said bolt or pin when undue pressure is exerted on the door, thus causing closing of the contacts of the switch.

3,967,081

SNAP SWITCH

Albert Portmann, Murten, and Jean-Claude Papaux, Fribourg, both of Switzerland, assignors to Sodeco-Saia S.A., Geneva, Switzerland

Filed July 25, 1974, Ser. No. 491,932

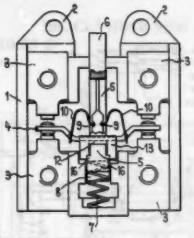
Claims priority, application Germany, Aug. 16, 1973, 2341488

Int. Cl.² H01H *13/28*

U.S. Cl. 200—67 PK **6 Claims**

1. A snap switch comprising a body, fixed contacts on said body, a contact bridge, an actuating member including a

frame portion having an opening, said contact bridge being centrally disposed in said opening, toggle springs acting between said bridge and said actuating member so that said bridge jumps from a position in contact with the contacts through a dead-center position to another position spaced



from said contacts in response to movement of said actuating member, and force lever drive means responsive to movement of said actuating member for separating said bridge from said contacts, said force lever drive means being disposed for engagement of said contact bridge at a central position thereof.

3,967,082

FLUID PRESSURE DROP INDICATOR FOR THE HYDRAULIC BRAKING SYSTEM OF A VEHICLE

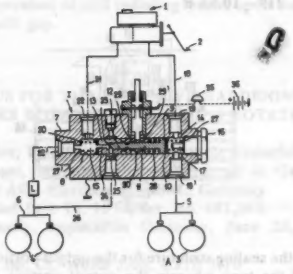
Patrick Remy, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault and Automobiles Peugeot, both of Boulogne-Billancourt, France

Filed Feb. 20, 1975, Ser. No. 551,398

Claims priority, application France, Feb. 25, 1974, 74.06271

Int. Cl.² H01H *35/38*

U.S. Cl. 200—82 D **1 Claim**



1. A pressure drop indicator for a braking system comprising two independent circuits, one of said circuits comprising a pressure limiter, said indicator comprising a body formed with a bore, a movable member slidably mounted in said bore and responsive to the pressure in both circuits, said movable member actuating a control element on an electric switch and closing an electric signal circuit in case of fluid leakage in one of said circuits, said movable member comprising a first piston provided with a rod movable in a bore formed in a second piston, said second piston further actuating said electric switch control element at two axial abutment positions of said second piston, said pistons providing at the ends of said bore in said body first and second chambers to which feed lines of said first and second circuits are connected, said second circuit comprising said pressure limiter, the pressure drop indicator being characterized in that the end of the rod said first piston comprises a valve means removably closing a passage hole formed in said second piston and providing a fluid passage between said second chamber, and an auxiliary chamber in said body for supplying fluid to the second circuit and bypass said pressure limiter when a pressure drop takes place in said first circuit and a spring disposed between the adjacent faces of said first piston and said second piston for constantly urging the valve of said first piston rod away from said second piston passage hole.

3,967,083

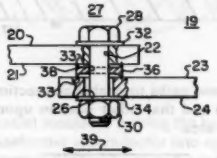
METHOD AND APPARATUS FOR ALIGNING AND AFFIXING PORTIONS OF CIRCUIT BREAKER APPARATUS

Fred Bould, Pittsburgh, and Norman Davies, East Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 27, 1974, Ser. No. 500,997

Int. Cl.² F16B *5/02*

U.S. Cl. 200—237 **22 Claims**



1. An adjustable link, comprising:

a first member having a generally planar surface;

a second member having a generally planar surface, said first member and said second member being disposed in spaced relationship, said planar surfaces being disposed in face to face relationship in parallel planes;

lock means disposed between said planar surfaces, said lock means having oppositely disposed edge portions which are generally transverse to said parallel surfaces for cutting into said surfaces as a compression force is applied to said first and said second members against said locking means and transverse to said parallel surfaces, said first and said second members being movable relative to one another within limits in a direction parallel to said parallel surfaces for adjustment of the disposition of said first member relative to said second member before said compression force is applied; and

compression means for applying said compression force to said first and said second members after said adjustment has been made for thereby providing a generally rigid link.

3,967,084

KEYBOARD SWITCH ASSEMBLIES HAVING TWO FOOT SUPPORT LEGS ON DOME-SHAPED CONTACT MEMBER

Walter R. Pounds, Lafayette, Colo., assignor to KB-Denver, Inc., Loveland, Colo.

Filed May 12, 1975, Ser. No. 576,694

Int. Cl.² H01H *1/06, 13/52*

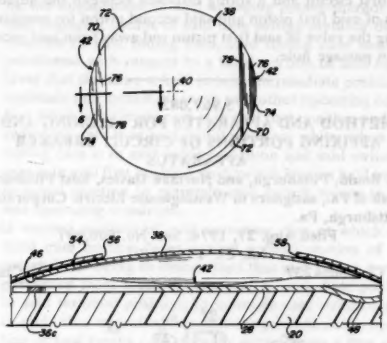
U.S. Cl. 200—275 **20 Claims**

1. In a keyboard assembly which includes an insulative substrate upon which are carried a plurality of conductive paths respective portions of which are selectively bridged upon depression of a conductive resilient contact element, the improvement comprising:

said contact element being in the shape of a dome and having only one pair of space-opposed regions of its marginal portion deformed downwardly away from its apex to constitute a pair of space-opposed feet;

and said dome-shaped element being disposed adjacent to said substrate with at least one of said feet being in electrical and physical contact with one of said portions of

one of said paths, the central area of said dome-shaped element being in registry over another of said portions in



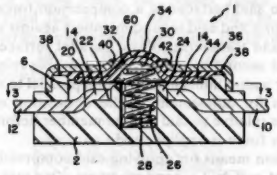
another of said paths to enable connection between said central area and that other portion upon depression of said central area.

3,967,085

SINGLE POLE MOMENTARY SWITCH

Joseph Larue Lockard, Harrisburg, and Bryce Wilson Blair, Hershey, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 27, 1974, Ser. No. 527,789
Int. Cl.² H01H 9/04
U.S. Cl. 200—302 **3 Claims**



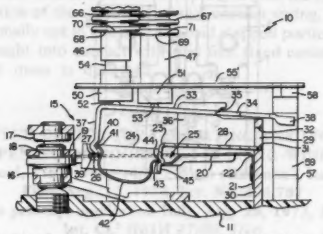
1. A momentary switch, comprising:
a base having an enlarged recess,
a pair of spaced contacts projecting into said recess,
said base having an integral hub projecting into said recess,
a spring seated in said hub and projecting outwardly into the recess of said base,
an inverted cup engaged against the projecting spring and received for displacement within said base recess,
said spring normally biasing said cup in a position spaced from said contacts,
an encircling lip on said cup,
a flexible diaphragm overlying said base and said cup,
a cover secured to said base and sandwiching a portion of said diaphragm between said cover and said base to provide a seal,
said cover having an aperture exposing a portion of said diaphragm which overlies said cup,
said diaphragm having a portion sandwiched between the lip of said cup and said cover,
said diaphragm and said cup being displaceable in a direction away from said cover collapsing said spring and engaging said contacts with said cup to complete an electrical circuit across said contacts.

3,967,086

ELECTRICAL SWITCH CONSTRUCTION

Werner R. Bauer, Radnor, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 12, 1975, Ser. No. 557,462
Int. Cl.² H01H 9/20
U.S. Cl. 200—328 **10 Claims**



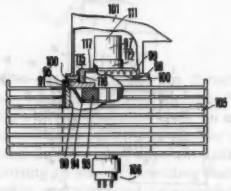
1. An electrical switch construction comprising a housing having a single electrical switch therein provided with only one movable contact, and a pair of actuators carried by said housing and both being operatively associated with said electrical switch for operating said electrical switch independently of each other, one of said actuators being automatically reset and the other of said actuators being manually reset.

3,967,087

SEALING STRUCTURES FOR THE OUTPUT PORTIONS OF MAGNETRONS

Yoji Kanuma, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 8, 1974, Ser. No. 513,097
Claims priority, application Japan, Oct. 11, 1973, 48-117475[U]
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 B **5 Claims**



1. In the sealing structure for the output portion of a magnetron of the type wherein the output portion is sealed to a support for the magnetron, said output portion including an antenna for supplying microwave energy to a load and an insulator for insulating said antenna from a base portion for said antenna constituting a part of the magnetron, the improvement wherein said support for the magnetron comprises a plate member with a annular bent portion formed about an opening at the central area of said plate member, said bent portion being provided with a plurality of axial slits, said base portion for said antenna comprising a pedestal which includes a cylindrical portion of a larger diameter than said insulator and a second plate member having an opening of a diameter approximately equal to the inner diameter of said insulator, the upper end of said cylindrical portion being integrally fixed to said second plate member, the lower end of said cylindrical portion being fixed to an element adjacent to the output portion of the magnetron, said base portion for said antenna being in electrical and mechanical contact with said annular bent portion.

3,967,088
GAP DETECTOR FOR MICROWAVE OVEN

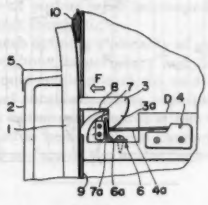
Masao Horiuchi, Tenri, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 9, 1973, Ser. No. 530,841

Claims priority, application Japan, Dec. 14, 1973, 48-140609

Int. Cl.[2] H05B 9/06

U.S. Cl. 219—10.55 C 20 Claims



1. In a microwave oven of the type including a casing structure defining an oven chamber, said casing structure being formed at one side thereof with an access opening communicating to said oven chamber, a door hingedly supported to said casing structure and selectively movable from an open position to a closed position for selectively opening and closing said access opening, means for radiating high-frequency electromagnetic energy into said oven chamber, and means for interlocking said door to said casing structure to lock said door in said closed position to close said access opening; the improvement comprising:

detecting means, mounted on one of said door and said casing structure at a position adjacent said access opening, for detecting the pressure of a gap between said door and said casing structure due to deformation of said door caused by the pressure of foreign matter between said door and said casing structure when said door is locked in said closed position by said interlocking means, and for halting operation of said radiating means upon the detection of such gap.

3,967,089
APPARATUS FOR THE INDUCTIVE HARDENING OF WORKPIECES ROTATABLE AROUND A ROTATIONAL AXIS

Gerhard Seulen; Friedhelm Reinke, both of Remscheid, and Edgar Stengel, Wuppertal-Hahnenberg, all of Germany, assignors to AEG-Elotherm G.m.b.H., Germany

Filed June 18, 1974, Ser. No. 481,364

Claims priority, application Germany, June 28, 1973, 2332832

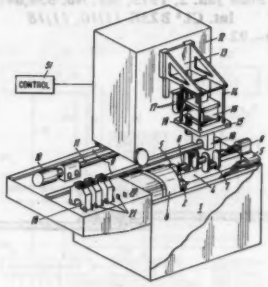
Int. Cl.[2] H05B 5/08; C21D 1/10

U.S. Cl. 219—10.67 16 Claims

1. An apparatus for the inductive hardening of workpieces which are rotatable about a rotational axis wherein various parts of the surface of the workpieces are heated by means of variably shaped inductors and wherein the workpiece is clamped horizontally with respect to a hardening carriage, said apparatus including means for moving said hardening carriage parallel to the rotational axis of said workpiece to selected operating positions, and a transformer plate which is vertically movable with respect to said hardening carriage, said transformer plate supporting a transformer thereon, the primary of said transformer being connected to a source of medium frequency power, the secondary of said transformer being connected to one of said inductors, said inductor being fixedly and removably attached to said transformer plate, the improvement comprising:

an inductor magazine disposed in the travel range of the hardening carriage, said variably shaped inductors being deposited one beside another in a parallel direction along one of the rotational axes of the workpieces in said magazine,

an automatically operated clutch for attaching an inductor to the transformer plate and for electrically connecting the inductor with the secondary of the transformer, and



a program control means for moving the hardening carriage and the transformer and inductor into operating position for the inductive hardening of said workpieces and into changing positions proximate said magazine for changing said inductors.

3,967,090
PROCESS FOR CONSUMABLE-ELECTRODE TYPE ARC CUTTING AND APPARATUS THEREFOR

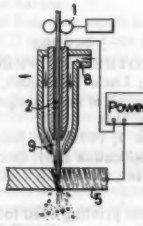
Masanobu Hamasaki, Takamatsu, and Fumikazu Tateiwa, Kagawa, both of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Nov. 12, 1974, Ser. No. 523,069

Claims priority, application Japan, Nov. 14, 1973, 48-128520

Int. Cl.[2] B23K 9/00

U.S. Cl. 219—70 6 Claims



1. A consumable-electrode type arc cutting process using a wire as the electrode, which comprises:

passing an electric current through the work subjected to cutting and the wire electrode protruding from a contact tip serving as the path for electric current for thereby producing a continuous electric arc between the wire electrode and the work,

allowing the work to be fused and severed by the arc and, at the same time, projecting a jet of water, pressurized to a value substantially in excess of atmospheric pressure, from a water projecting nozzle disposed around the periphery of the contact tip to the freshly fused point of work, and

continuing the arc cutting while causing the molten metal of the work to be blown away from the severed edges by the jet of water.

3,967,091
CAPILLARY FLOW WELD-BONDING

Robert W. Vaughan, Manhattan Beach, and Robert J. Jones, Hermosa Beach, both of Calif., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 2, 1975, Ser. No. 538,047
Int. Cl.[2] B23K *11/10, 11/18*
U.S. Cl. 219—92 2 Claims

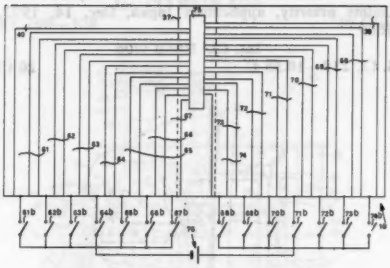
1. A process for weld-bonding titanium comprising:
A. bringing at least two titanium plates into contact with each other;
B. spot-welding to joint said plates;
C. applying a bead of resin adhesive to the edge of the joint; and
D. heating said adhesive whereby said adhesive flows between said plates by capillary action and cures to form a structurally strong weld-bonded layer.

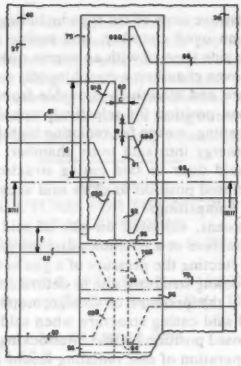
3,967,092
ELECTROTHERMAL PRINT HEAD

Renato Conta, Ivrea; Lucio Montanari, Cascinette, and Riccardo Brescia, Ivrea, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Oct. 7, 1974, Ser. No. 512,564
Claims priority, application Italy, Oct. 23, 1973, 70117/73
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—216 5 Claims

1. An electrothermal printing head for the impactless printing of dot matrix characters of a heat-sensitive recording medium, continously moving with respect to said head during the printing operations, comprising: an electrically insulating support; a plurality of resistive printing elements aligned along a given line and comprising a single strip of resistive material extending along said given line and carried by said support, each element comprising a segment of the strip of resistive material and having a partly cylindrical outer surface concave towards the support, the generatrices of the partly cylindrical outer surfaces of all segments being parallel to said given line; and a pattern of conductors carried by said support for selectively energizing the elements comprising a first group of conductors spaced along and contacting one side of the strip, and a second group of conductors spaced along and contacting the other side of the strip in a staggered relationship to the conductors of the first group wherein each conductor of the second group is partly opposed to two adjacent conductors of the first group and each resistive segment of said strip lying between a given conductor of the first group and a given conductor of the second group partly opposed to the given



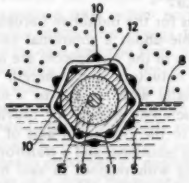


conductor of the first group is selectively heated upon application of an electric voltage between the given conductors.

3,967,093
HEATING APPARATUS WITH HEAT MEDIUM VAPOR

Shigeo Oi, 929-4 Nakahigano, Inasato-cho, Nagano, Japan

Filed June 10, 1974, Ser. No. 477,616
Claims priority, application Japan, June 14, 1973, 48-66411
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—388 1 Claim



1. A heating apparatus with heat medium vapor, including a plurality of closed elongated vessels having surfaces for receiving fibrous materials, the upper parts of the vessels being communicated with a lateral condensate trough and the lower parts of the vessels being communicated to one another with a heat medium liquid container, the bottom of which contains a substantially constant level of a heat medium liquid,

and a heat medium vapor chamber formed on the free level of the heat medium liquid, the improvement comprising:

an electric heater of elongated, form placed along the free level of the heat medium liquid in the heat medium container, and being only partly immersed therein so that the upper surface of the heater projects above the free surface of the liquid; and

a means for wicking a thin film of liquid by capillary action from the heat medium liquid onto the upper, non-immersed surface of the heater, said means comprising a single layer of porous mesh telescoped over the heater and in contact therewith;

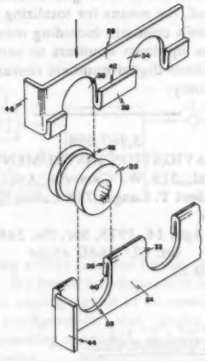
said porous mesh defining a plurality of voids adjacent said heater throughout its periphery and length, above and below the liquid medium level; the voids above said liquid medium level constantly filling with fluid medium liquid by capillary action so that a thin film of liquid is constantly placed in heat exchange contact with the upper, unimmersed surface of the heater for evaporation.

3,967,094

ELECTRIC HEATING UNIT SUPPORT ASSEMBLY

Robert E. Petersen, Grafton, and Robert J. Dietsche, Elyria, both of Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 28, 1975, Ser. No. 626,413
Int. Cl.² H05B 3/02
U.S. Cl. 219—532 **4 Claims**



1. A support member carrying insulating bushings for supporting an open coil electrical heating element, comprising:

a pair of strips, each having a number of spaced-apart, open-side cutouts with intervening webs having retroverted end margins, placed in opposed, lapping and registering relation with the cutouts forming openings for the insulating bushings and the end edges of said margins facing each other;

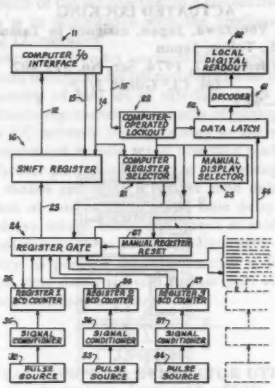
an insulating bushing in each said opening, said bushing including a circumferential groove of a width approximating the sum of four single thicknesses of said strips so that the assembly of the strips in the lapping relation can be effected with said bushings seated in place in the cutouts of one of said strips, the lateral restraint effected by the sides of the grooves holding the strips in a position that the end edges are maintained in an interfering relation preventing disengagement of the strips from their lapping relation.

3,967,095

MULTI-COUNTER REGISTER

William M. Herring, Campton Township, and Dennis B. Walling, Darien, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Aug. 26, 1974, Ser. No. 500,321
Int. Cl.² H03K 21/12
U.S. Cl. 235—92 EA **30 Claims**



1. A multi-counter register system, useful for reading individual accumulated counts in a set of BCD counter means at a local area by local readout means at the local area or by a computer located at a remote area and using a communications bus connecting the multi-counter register system at the local area and the computer, which comprises:

sets of gate means, each set of gate means having:

at least one set of four outputs to provide a BCD signal from said set of gate means; and

at least one set of four inputs to receive a BCD signal at said set of inputs, said one set of four inputs of each of said sets of gate means being connectable to a different BCD counter means of a set of BCD counter means;

data storage means having:

at least one set of four data inputs to receive digital information as a BCD signal, said one set of four data inputs being connected to each of said one set of four outputs of said sets of gate means;

at least one set of four other inputs to receive a BCD signal corresponding to the decimal number assigned to the BCD counter means that is connectable to said one set of said sets of gate means; and

at least one set of outputs to transmit at the same time digital information as a BCD signal based on the digital information received at one of said sets of four inputs of said storage means;

means to provide different BCD signals at four outputs, each of said different BCD signals corresponding to the decimal number assigned to a different one of the BCD counter means that are connectable to different said one sets of said four inputs of said sets of gate means, said one set of four outputs of said BCD signal-providing means being connected to said one set of four other inputs of said data storage means; and

means responsive to BCD signals, said signal-responsive means having BCD inputs connected to said four outputs of said BCD signal-providing means and having a number of outputs each connected to an enable input of a different set of said sets of gate means, said signal-responsive means providing a signal at a different one of said number of outputs, for different BCD signals at said inputs of said signal-responsive means provided by said signal-providing means, to enable selectively one of said set of gate means

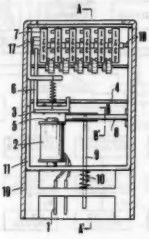
so that the BCD counter means connected to that enabled set of gate means is operatively connected to said one set of four data inputs of said data storage means for transfer of digital information from that BCD counter means to said storage means.

3,967,096

ELECTROMAGNETIC COUNTERS WITH MECHANICAL ACTUATED LOCKING

Soichi Ando, Yonezawa, Japan, assignor to Tamura Electric Works, Ltd., Tokyo, Japan

Filed Oct. 7, 1974, Ser. No. 512,402
Int. Cl.² G06M *3/12*
U.S. Cl. 235—92 C **3 Claims**



1. In an electromagnetic counter provided with a plug socket and adapted to be plugged into a socket holder wherein a digit wheel is operated by an armature of an electromagnet through a pawl, and said digit wheel, pawl, armature and electromagnet are mounted on a supporting frame, the improvement which comprises a member for locking the armature which is adapted to be pivoted between said armature and said electromagnet under spring bias, and a rod displaceable against spring bias to cause said member to deviate from the region between said armature and said electromagnet, said rod extending from said plug socket and displaced upon plugging the counter into said socket holder.

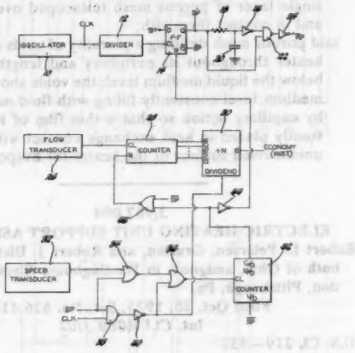
3,967,097

VEHICLE FUEL ECONOMY CALCULATOR AND INDICATOR

John A. Moretti, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 15, 1975, Ser. No. 613,081
Int. Cl.² G01M *15/00*
U.S. Cl. 235—150.21 **3 Claims**

1. A vehicle fuel economy calculator comprising: a flow transducer for generating fuel flow pulses having a frequency proportional to vehicle fuel flow rate; a speed transducer for generating speed pulses having a frequency proportional to vehicle speed; means responsive to the fuel flow pulses and the speed pulses for generating a first series of pulse groups, the number of pulses in each pulse group in the first series representing the instantaneous vehicle fuel economy; a plurality of digital up/down counters, each of the counters having data inputs and data outputs and being presettable to a digital number applied to its data inputs; a plurality of memory circuits, the number of memory circuits being one less than the number of up/down counters; means coupling each memory circuit between the data inputs and outputs of a respective pair of up/down counters to form a series of up/down counters interconnected by the memory circuits; a divider for dividing the number of pulses coupled thereto by the number of up/down counters and supplying a number of pulses equal to the quotient; means for coupling the first series of pulse groups to the divider, the divider supplying a second series of pulse groups, the number of pulses in each pulse group in the second series representing the instantaneous vehicle fuel economy divided by the first number; means for counting up the first up/down counter in the series of up/down counters with the pulses in the second series of pulse groups to generate a digital number representing the number of pulses counted; and means after each pulse group in the second series for sequentially enabling each memory circuit to memorize the digital number at the up/down counter data outputs coupled therewith and to apply the memorized digital number to the up/-



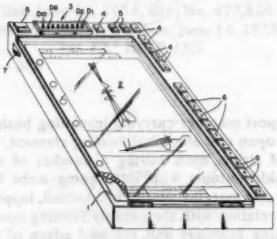
down counter data inputs coupled therewith, totalizing the digital numbers in the up/down counters, and presetting each of the up/down counters to the digital number applied to the data inputs thereof, the means for totalizing the digital numbers in the up/down counters including means for counting down each of the up/down counters to zero in succession, whereby the totalized digital numbers represents an average vehicle fuel economy.

3,967,098

NAVIGATION INSTRUMENT

Gary L. Harnagel, 319 W. Cameron Ave., Pamona, Calif. 91767, and Robert T. Longo, 734 Calita St., Arcadia, both of Calif. 91006

Filed Apr. 14, 1975, Ser. No. 568,162
Int. Cl.² B64D *45/04*
U.S. Cl. 235—150.22 **7 Claims**



1. Navigation instrument comprising:
means for displaying a navigation chart;
a calculator circuit for performing arithmetic calculations, said calculator circuit including an output register;
display means for visually displaying a number in the output register of said calculator means;
means for manually entering data from the navigation chart to said calculator means;
means for manually entering operation signals to said calculator means;

an enabling signal, said enabling signal being manually activated;

clock means for providing a signal once each second; and

circuit means for entering data and operation signals to said calculator circuit in response to said enabling signal and the signal from said clock means, to add one to the number in the output register of said calculator circuit each second.

3,967,099
FILTER HAVING FREQUENCY-DEPENDENT TRANSMISSION PROPERTIES FOR ELECTRIC ANALOG SIGNALS

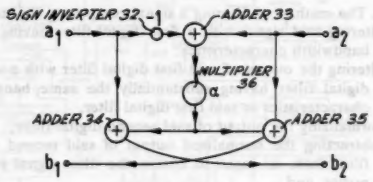
Alfred Fettweis, Bochum, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

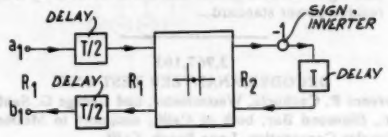
Continuation of Ser. No. 148,577, June 1, 1971, abandoned. This application Oct. 1, 1973, Ser. No. 402,348

Claims priority, application Germany, June 3, 1970, 2027303

Int. Cl.² G06F *15/34*; H03H *7/10*

U.S. Cl. 235—152 **18 Claims**





1. A filter having a filter function for discrete electric signals corresponding to the frequency-dependent transmission properties for electric analog signals of an analog LC-network of predetermined configuration and having predetermined impedance-representing constants,

said filter comprising

a. a basic filter circuit having a plurality of port elements with ports each including a port input and a port output,

b. at least one of said port elements being a one-port element, said one-port element comprising time delay means having a predetermined time delay, said time delay means being connected between the port input and the port output of the one-port element and being operable for receiving an input signal from the port input of the one-port element, and for supplying an output signal to the port output of the one-port element in accordance with said input signal but delayed by said predetermined time delay;

c. said plurality of port elements of said basic filter circuit comprising further port element means including further port input means and further port output means, and

d. said basic filter circuit comprising interface device means interconnecting said port elements, said interface device means having a set of interface ports comprising first and second interface ports each with an interface port input and an interface port output, the interface port input and the interface port output of the first interface port being connected respectively with the further port output means and the further port input means of the further port element means, and the interface port output and the interface port input of the second interface port being connected respectively with the port input and the port output of said one-port element,

e. said interface device means comprising interface circuitry including adder means and multiplier means connected with the set of interface ports and connecting the interface ports of the set together in a connective relationship which is in accordance with the configuration of said analog LC-network,

f. said interface circuitry having a multiplier coefficient for each said multiplier means correlated with the connective relationship of said set of interface ports and with the impedance-representing constants of analog components of the LC-network corresponding to the port elements interconnected by said set of interface ports, and

g. said further port element means comprising further time delay means providing a further time delay which is a function of said predetermined time delay, said further time delay means being interposed in said further port element means so as to be in series with said interface circuitry to prevent the existence of a feedback loop without time delay via said further port element means and said interface circuitry.

3,967,100
DIGITAL FUNCTION GENERATOR UTILIZING CASCADE ACCUMULATION

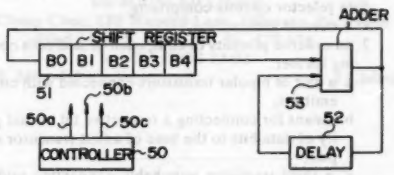
Naonobu Shimomura, No. 13-8, Sakuragaota-cho, Shibuya, Tokyo, Japan

Filed Sept. 13, 1974, Ser. No. 505,849

Claims priority, application Japan, Nov. 12, 1973, 48-126899; Feb. 1, 1974, 49-13470; Feb. 13, 1974, 49-17360; Apr. 5, 1974, 49-38634; July 23, 1974, 49-84298

Int. Cl.² G06F *1/02*

U.S. Cl. 235—152 **30 Claims**



10. Apparatus for obtaining a digital value of a function expressed by:

$$w = a_0 + a_1x + a_2x^2 + \ldots + a_ix^i + \ldots + a_nx^n$$

where w is the function the value of which is to be obtained,

$a_0, a_1, a_2, \ldots, a_i, \ldots, a_n$ are constants,

x is the independent variable, and

$n \geqq 2$ comprising:

plural memories designated by addresses **0, 1, 2,** . . . , i, . . . , n, each having a word length and means for loading said memories with a specific, initial numerical value determined by the constants $a_0, a_1, a_2, \ldots, a_i, \ldots a_n$,

means for arranging said memories in a shift register means,

algebraic addition means having first and second inputs and an output,

delay means having an input and an output,

means connecting the output of said shift register to one of the inputs of said algebraic addition means,

means connecting the output of said algebraic addition means to the input of said shift register means, and also to the input of said delay means,

means connecting the output of said delay means to the other input of said algebraic addition means, and

means for repeatedly shifing said shift register a number of cycles corresponding to the value of the independent variable x.

3,967,101

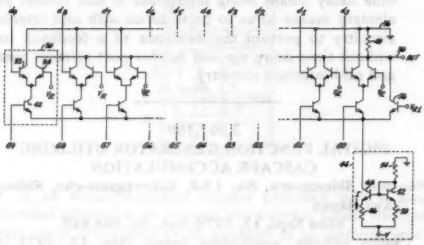
DATA ALIGNMENT CIRCUIT

Darrell L. Fett, Scottsdale, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Mar. 17, 1975, Ser. No. 559,115

Int. Cl.² G06F 7/00

U.S. Cl. 235—152 **6 Claims**



1. Means for shifting a plurality of data bits in alignment comprising:

A. an ordered plurality of data selector circuits, each of said data selector circuits comprising:

1. a current source;

2. an ordered plurality of cells, each of said cells comprising further:

a. a pair of bipolar transistors connected with common emitters;

b. means for connecting a respective bit of said plurality of data bits to the base of a first transistor of said pair;

c. a third transistor switchably connecting said common emitters to said current source;

3. a reference voltage potential terminal connected to the base of each of said second transistors;

4. a voltage potential terminal connected to the collector of each of said first transistors;

5. an output terminal connected to the collector of each of said second transistors;

6. resistive means connecting said voltage terminal to said output terminal;

7. means for connecting the base of the first transistor of each of said pairs to the base of the first transistor of said pairs in the successive cell in the successive data selector circuit;

8. first means for connecting the base of each of said third transistors of each cell to the base of each third transistor of respective cells in successive data selector circuits;

B. actuation means connected to said first means for enabling only one of said cells of each of said data selector circuits to transmit selected data bits as a plural bit output;

C. control means connected to said actuation means for determining which of said data bits are to be selected as said plural bit output.

3,967,102

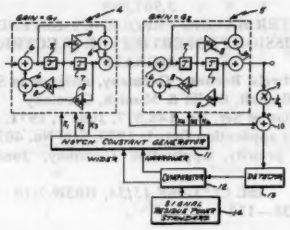
SELF-ADJUSTING DIGITAL NOTCH FILTER

Rainer F. McCown, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 25, 1975, Ser. No. 561,962

Int. Cl.² G06F 15/34; H03H 7/10

U.S. Cl. 235—152 **2 Claims**



1. The method of filtering a signal comprising the steps of

filtering said signal with a first digital filter having given bandwidth characteristics,

filtering the output of said first digital filter with a second digital filter having substantially the same bandwidth characteristics as said first digital filter,

normalizing the output of said second digital filter,

subtracting the normalized output of said second digital filter from its input to obtain the filter signal residue power, and

varying the bandwidth control constants of said first and second digital filters in response to deviations between said signal residue power and limits defined by a signal residue power standard.

3,967,103

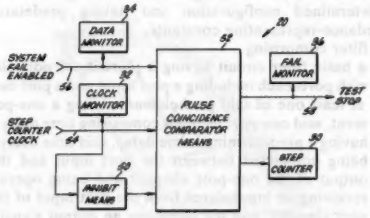
DECODER/ANALYZER TEST UNIT

Lawrence P. Cachuela, Westminster, and George G. Sanford, Jr., Diamond Bar, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Apr. 14, 1975, Ser. No. 567,747

Int. Cl.² G06F 11/04

U.S. Cl. 235—153 AC **10 Claims**



1. For use with a computer including built in test equipment for subjecting said computer to a sequence of discrete tests, said computer providing a discrete test initiating signal and a corresponding discrete test satisfactory signal when test response of said computer to each discrete test is correct, and said computer being responsive to a test stop signal to halt test sequencing of said computer, a test unit comprising:

means for comparing for coincidence of said discrete test initiating signal and said discrete test satisfactory signal corresponding thereto, said comparing means providing a test stop signal for halting test sequencing of said computer upon a lack of coincidence of said discrete test

initiating signal and said discrete test satisfactory signal normally corresponding thereto;

step counter means for counting said discrete tests and indicating the particular discrete test that said computer is undergoing; and

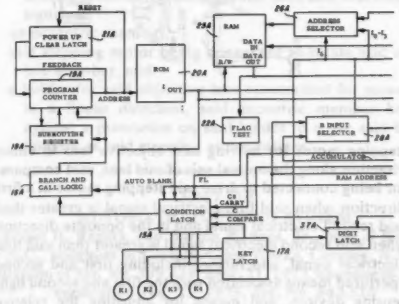
means for processing said discrete test initiating signal and providing a processed signal to step said counter means.

3,967,104

DIRECT AND INDIRECT ADDRESSING IN AN ELECTRONIC DIGITAL CALCULATOR

George L. Brantingham, Richardson, and Louis H. Phillips, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 26, 1974, Ser. No. 527,505
Int. Cl.² G06F 9/20, 15/02
U.S. Cl. 235—156 8 Claims



1. In an electronic calculator system having an addressable data storage means, an arithmetic unit for performing arithmetic computations on data and control circuitry including an instruction storage means for providing multi-bit commands at the output thereof which define the operation of the system, a circuit for providing both direct and indirect addresses of said data storage means comprising:

a. means in said arithmetic unit for computing indirect addresses of said data storage means;

b. register means coupled to said arithmetic unit for storing the computed indirect addresses;

c. selector means having first and second data inputs, a control input and a data output, said selector means being coupled at said first input to first selected bits at the output of said instruction storage means at said second input to said register means and at the output thereof to said addressable data storage means for providing either said first selected bits from said instruction storage means as a direct address or the computed indirect address from said register means to address said data storage means; and

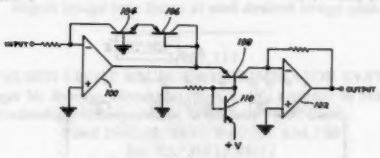
d. means coupling second different selected bits at the output of said instruction storage means to the control input of said selector means, said second selected bits for controlling said selector means to select the direct or the indirect address in accordance with the multi-bit commands provided at the output of said instruction storage means.

3,967,105

TRANSISTOR POWER AND ROOT COMPUTING SYSTEM

Daniel Clayton Harrington, Fridley, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed May 19, 1975, Ser. No. 578,567
Int. Cl.² G06G 7/16, 7/20
U.S. Cl. 235—197 13 Claims



1. A non-linear transistor computing element comprising:

an operational amplifier having an output and positive and negative inputs,

a first transistor having its collector connected to the negative input of said amplifier, and

a second transistor having its base connected to the output of said amplifier,

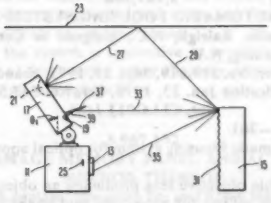
said first and second transistors being operably connected so that the output of said operational amplifier is determined by the feedback loop comprising said first and second transistors and having a non-linear relationship to the input determined by the collector current of at least one of said transistors operating with a near zero collector base voltage.

3,967,106

DEVICE FOR ENABLING A FIXED SENSOR OF AN AUTOMATIC ELECTRONIC FLASH UNIT TO RESPOND TO BOUNCED LIGHT

Tung Chang Chen, 138 Wooded Lane, Villanova, Pa. 19085

Filed May 15, 1975, Ser. No. 577,676
Int. Cl.² G03B 15/02
U.S. Cl. 240—1.3 5 Claims



1. A device to be employed with a camera flash unit arrangement which is composed of a housing means having a flash unit and light sensor means disposed therein in fixed relationship with respect to one another, comprising in combination: light reflecting means; support means disposed in close proximity to said sensor means and secured to said light reflecting means for providing support thereto and formed to permit partial rotation thereof with respect to said housing means, said support means further formed to be movably engaged with said housing means whereby said light reflecting means can be moved and held in a plurality of positions with respect to said light sensor means whereby reflected light from said flash unit can be directed to said light sensor means.

3,967,107
OPERATING THEATER LIGHT

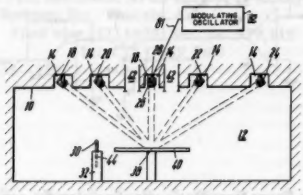
Klaus Junginger, Rodenbach, and Walter Sturm, Hanau, both of Germany, assignors to Original Hanau Quarzlampen GmbH, Hanau, Germany

Filed Oct. 5, 1973, Ser. No. 403,895

Claims priority, application Germany, Oct. 7, 1972, 2249347

Int. Cl.[2] A61G *13/00*; F21V *33/00*

U.S. Cl. 240—1.4 **1 Claim**



1. An illumination system, comprising, in combination:
a plurality of spotlamps each of which is separately and independently pivotably mounted and separately and independently driven;
said plurality of spotlamps including a pinpointing spotlamp and several individual satellite spotlamps;
said pinpointing spotlamp being adjustable to select a desired area to be illuminated;
said pinpointing spotlamp being disposed substantially perpendicularly above an operating table within the confines of which said area to be illuminated is disposed;
said individual satellite spotlamps being suspended at different and varying distances from said operating table;
each said satellite spotlamp being provided with a photoelectric servomechanism including a follow-up control system which operates in response to light from said area illuminated by said pinpointing spotlamp to adjust the associated satellite spotlamp;
said illumination system including means for switching off the satellite spotlights and switching on the follow-up system to avoid unwanted optical disturbance of the photoelectric mechanism.

3,967,108
AUTOMATIC FOCUSING SYSTEM

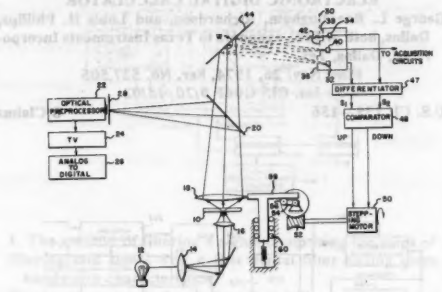
David L. Hollis, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 399,619, Sept. 21, 1973, abandoned. This application Jan. 23, 1975, Ser. No. 543,514

Int. Cl.[2] G01J *1/20*

U.S. Cl. 250—201 **9 Claims**

9. An automatic focusing system for optical apparatus comprising:
an adjustable objective lens producing an object image,
a first beam splitter for projecting said image to an actual image plane,
utilization means positioned at a desired image plane which is coincident with said actual image plane when said object image is in focus for producing an electrical output representing selected optical characteristics of said image,
a second beam splitter receiving the image projected from said first beam splitter, said second beam splitter projecting said image to first and second parfocal image planes,
first and second light sensing devices for receiving light from in front of said first parfocal image plane and behind said second parfocal image plane respectively, said light sensing devices respectively producing first and second electrical signals representing the position of said actual image plane with respect to said desired image plane,
means responsive to said first and second electrical signals for automatically positioning said adjustable objective lens to bring said object image into focus at said desired image plane,
a differentiator, said electrical signals from said light sensing devices being applied to said differentiator to produce differentiated electrical signals,
a comparator for comparing said differentiated electrical signals, the output of said comparator being applied to said means for automatically positioning said adjustable objective lens, and



a stepping motor for moving said objective lens in either direction along the optical axis of said lens, said comparator being connected to drive said stepping motor in a first direction when said first electrical signal is greater than said second electrical signal and in the opposite direction when said second electrical signal is greater than said first electrical signal, and further including first and second apertured means associated with the first and second light sensing devices, and means for adjusting the relative positions between said apertured means so that the same portion of an image is projected out to said first and second light sensing devices.

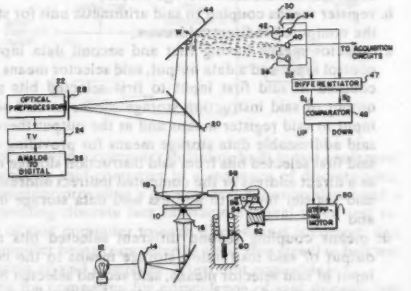
3,967,109
AUTOMATIC FOCUSING SYSTEM

Lynn G. Amos, Raleigh, and Jerry S. Boone, Garner, both of N.C., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 399,619, Sept. 21, 1973, abandoned. This application Jan. 23, 1975, Ser. No. 543,515

Int. Cl.[2] G01J *1/20*

U.S. Cl. 250—201 **10 Claims**



5. A system producing an electrical output representing the optical characteristics of an analytical slide comprising:

an adjustable objective lens producing an image of said slide,

means for projecting the slide image to an actual image plane and to a parfocal image plane,

conversion means positioned at a desired image plane which is coincident with said actual image plane when said slide image is in focus, said conversion means producing said electrical output representing the optical characteristics of said slide,

first and second light sensing devices respectively receiving light from in front of said parfocal image plane, and behind said parfocal image plane, said light sensing devices respectively producing first and second electrical signals representing the position of said actual image plane with respect to said desired image plane,

a stepping motor for moving said objective lens in either direction along the optical axis of said lens,

a comparator for comparing the signals from said first and second light sensing devices, said comparator being connected to drive said stepping motor in a first direction when said first electrical signal is greater than said second electrical signal and in the opposite direction when said second electrical signal is greater than said first electrical signal,

an eccentric member,

said stepping motor being connected to rotate said eccentric member, and

a holder for said objective lens constrained for movement in a linear direction, said eccentric member bearing against a protrusion on said holder to move said holder linearly as said stepping motor rotates.

3,967,110

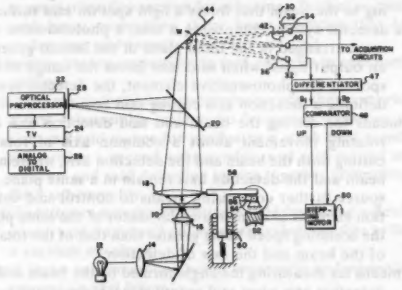
AUTOMATIC FOCUSING SYSTEM

Charles H. Rogers, and Burton H. Sage, Jr., both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 399,619, Sept. 21, 1973, abandoned. This application Jan. 23, 1975, Ser. No. 543,516

Int. Cl.² G01J *1/20*

U.S. Cl. 250—201 **5 Claims**



5. An automatic focusing system for optical apparatus comprising:

an adjustable objective lens producing an object image,

a beam splitter for projecting said image to an actual image plane and to a parfocal image plane,

utilization means positioned at a desired image plane which is coincident with said actual image plane when said object image is in focus for producing an electrical output representing selected optical characteristics of said image,

first and second light sensing devices for receiving light from in front of said parfocal image plane and behind said parfocal image plane, respectively, said light sensing devices respectively producing first and second electrical signals, the frequency distribution of which represent the position of the actual image plane with respect to said desired image plane,

a rotating mirror comprising at least one planar surface for scanning said slide image across both of said light sensing devices, and

means responsive to the higher frequency components of said first and second electrical signals for automatically positioning said adjustable objective lens to bring said object image into focus at said desired image plane.

3,967,111

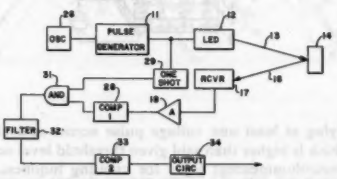
PULSED LIGHT SOURCE DISCRIMINATOR SYSTEM

Roger M. Brown, Mountain View, Calif., assignor to Scientific Technology Incorporated, Mountain View, Calif.

Filed Dec. 20, 1974, Ser. No. 534,728

Int. Cl.² H01J *39/12*

U.S. Cl. 250—206 **10 Claims**



7. A discriminator system for receiving pulsed light comprising

a pulse generator for producing output pulses,

an oscillator connected to said pulse generator for frequency modulation of said output pulses over a predetermined frequency range,

a light source producing light pulses excited by said output pulses,

a light sensitive receiver for receiving said light pulses and producing an electrical output related thereto,

means for receiving said electrical output and producing a first gating signal in predetermined time phase therewith,

means for receiving said pulses and producing a second gating signal in predetermined time phase therewith,

and means for receiving said first and second gating signals for producing a gated signal when said first and second gating signals are in time phase,

whereby the system is insensitive to spurious light energy signals at frequencies other than the instantaneous frequency of said light source.

3,967,112

PHOTO-IMAGE MEMORY PANEL AND ACTIVATING METHOD THEREOF

Yoshiharu Kanatani; Masahiro Ise, and Etsuo Mizukami, all of Tenri, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed June 12, 1974, Ser. No. 478,614

Claims priority, application Japan, June 15, 1973, 48-68118; June 15, 1973, 48-68119

Int. Cl.² H01J *31/50*

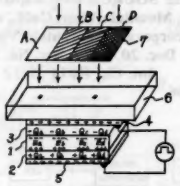
U.S. Cl. 250—213 R **9 Claims**

1. A method for driving an image display panel which comprises an electroluminescent layer having a given threshold level for initiating electroluminescence therein, a pair of dielectric layers for sandwiching said electroluminescent layer therebetween to form a three layer sandwiched structure and a pair of electrodes for supporting said sandwiched structure, said method comprising the steps of:

applying a DC bias voltage having a level which is less than said given threshold level between said electrodes and

thus across the electroluminescent layer and said dielectric layers;

applying a light pattern to said display panel when in the DC biased condition to provide the formation of an electrical polarization charge pattern corresponding to said light pattern about the interfaces between said electroluminescent layer and said dielectric layers due to said application of light, the light excited electrical polarization charge pattern being sustained by the inherent memory effects of said sandwiched structure; and



applying at least one voltage pulse across said electrodes which is higher than said given threshold level across said electroluminescent layer for creating luminescent light emission in accordance with said electrical polarization charge pattern in the interfaces between said electroluminescent layer and said dielectric layers and thus reading out the internal charge pattern in the form of light emission.

3,967,113

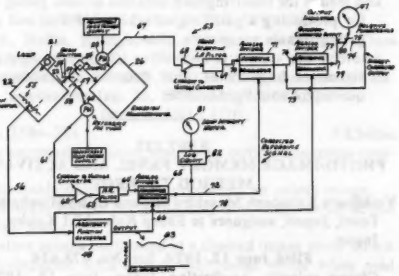
WAVELENGTH-CORRECTED SPECTROFLUOROMETER

Charles Soodak, Silver Spring, and James H. Macemon, Glen Burnie, both of Md., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Dec. 5, 1974, Ser. No. 530,053

Int. Cl.² H01J 39/12

U.S. Cl. 250—214 C **26 Claims**



1. A spectrophotometer device including wavelength-scanning monochromator means provided with means to generate a continuous wavelength-proportional linear voltage signal, voltage-responsive circuit means connected to said monochromator means to generate a continuous wavelength-dependent correction signal controlled by and varying in accordance with said linear voltage signal, electrical photosensitive means located to receive radiation from said monochromator means, and circuit means to apply said correction signal to the output of said photosensitive means.

3,967,114

DEVICE FOR DETERMINING THE PROFILE OF A SURFACE

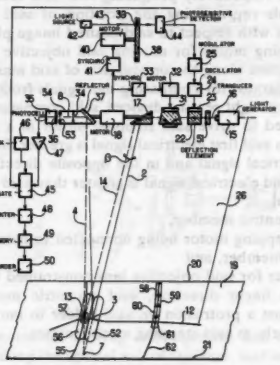
Jean Cornillault, Montlhery, France, assignor to Compagnie Industrielle des Lasers, Marcoussis, France

Filed Dec. 19, 1974, Ser. No. 534,396

Claims priority, application France, Jan. 10, 1974, 74.00766

Int. Cl.² H01J 3/14

U.S. Cl. 250—236 **4 Claims**



1. In a device for determining the profile of a surface comprising:

a source comprising a light generator providing an optical beam, a controllable deflection element arranged to receive the light emitted from the said generator and a first deflector arranged to receive the light emerging from said deflection element and to reflect back that light according to the beam that forms a light spot on said surface;

a detector system comprising a lens, a photosensitive element arranged in the focal plane of the lens to generate an output signal when said lens forms the image of said spot on the photosensitive element, the detector system defining a detection axis cutting said beam;

means for driving the beam and said detection axis in a rotating movement about a common axis of rotation cutting both the beam and the detection axis, wherein the beam and the detection axis remain in a same plane, the source further comprising means to control said deflection element to scan an angular sector of the same plane, the scanning speed being greater than that of the rotation of the beam and the axis of detection;

means for measuring the angle formed by the beam and the detection axis when said output signal is generated by the said photosensitive element, wherein the improvement comprises:

a Dove prism arranged on the same axis of rotation between said deflection element and the first reflector and means for driving said Dove prism in a rotating movement;

the detection system further comprising a second reflector arranged so that the light which propagates along the axis of detection is reflected back towards said lens along said same axis of rotation, said first and second reflectors being mechanically coupled together, their planes being respectively perpendicular to said same plane; and

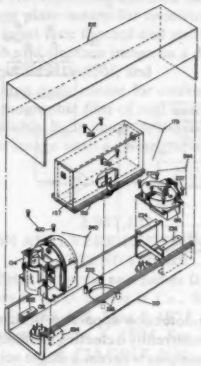
said means for driving the beam and the axis of detection about the same axis of rotation includes means for making said first and second reflectors rotate about the same axis of rotation at a speed synchronized with that of the Dove prism.

3,967,115

ATOMIC BEAM TUBE

Robert H. Kern, Danvers, Mass., assignor to Frequency & Time Systems, Inc., Danvers, Mass.

Filed Oct. 9, 1974, Ser. No. 513,289
Int. Cl.² H01S 1/00
U.S. Cl. 250—251 6 Claims



6. Molecular beam tube apparatus comprising
enclosure means,
a source for providing a beam of molecular particles
a first state selector for selecting a portion of said particles in said beam
a radio frequency transition section downstream from said first state selector for causing resonance transitions of some of said selected beam particles
means for producing a weak generally homogeneous magnetic field in the radio frequency transition section
a second state selector downstream from said radio frequency transition section for selecting a further portion of said beam comprising those beam particles that have undergone said resonance transitions, and
detecting means responsive to said particles in said further portion,
said source and said first state selector together comprising a first subassembly, said radio frequency transition section and said means for producing a weak field together comprising a second subassembly, and said second state selector and said detecting means together comprising a third subassembly,
said enclosure means comprising a rigid frame and a flexible cover, said frame and cover being sealed together to form a vacuum envelope,
said three subassemblies being separately and removably secured to said frame.

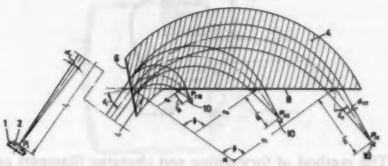
3,967,116

MASS SPECTROMETER

Jens F. Geerk, Schondorf, Germany, assignor to Varian Mat GmbH, Bremen, Germany

Filed Apr. 15, 1975, Ser. No. 568,349
Int. Cl.² B01D 59/44; G21K 1/08
U.S. Cl. 250—298 7 Claims

1. A mass spectrometer, more particularly for simultaneously measuring beams of a number of species of ions, having a special homogeneous magnetic sector field, the exit boundary of said field forming a straight line which extends through the point of inersection between the central ray of the incident object-ray pencil of ions and the straight entrance boundary of said field, at least one of the emergent image-ray pencils of ions undergoing second-order directional focusing, characterised in that the lateral magnification V lies in the range $0 \leq V \leq 1$, the angle of deflection ϕ in the sector field (4) is between 70.5° and 131.8°, the angle ϵ_1 between the central ray of the incident object-ray pencil (3) and the perpendicular erected at the point of intersection between the central ray and the entrance boundary (6) is between 0° and 90°, the distance l_1 between the object point (P_1) of the ion source (1) and the point of intersection (S_1) between the



central ray of the object-ray pencil (3) and the straight entrance boundary (6) of the sector field (4) is between 0 and infinity and the distance l_2 between the image point (P_{2I}, P_{2II}, P_{2III}) of the ion source and the point of inersection (S_{2I}, S_{2II}, S_{2III}) between the central ray of the second-order directionally-focused image-beam pencil and the straight exit boundary (8) of the sector field (4) is between 0.236 and 0.943, and if one of the freely-selectable pairs of values V, ϕ; V, ϵ_1; V, l_1; V, l_2; ϕ, ϵ_1; ϕ, l_1; ϕ, l_2; ϵ_1, l_1; ϵ_1, l_2; l_1, l_2 is given and if the radius of deflection r is equal to unity, the other defining quantities are obtained from the equations of condition:

$$\tan \epsilon_1 = -\frac{1+\cos\phi}{\sin\phi} \cdot \frac{3\cos\phi - V^2 + 3V - 1}{3\cos\phi + 2V^2 - 3V^2 + 2} \quad 7.$$

$$l_1 = \frac{1}{3} \cdot \frac{\sin\phi}{1+\cos\phi} \cdot \frac{3\cos\phi + 2V^2 - 3V^2 + 2}{(1-V^2)\,V} \quad 9.$$

$$l_2 = \frac{1}{3} \cdot \frac{\sin\phi}{1+\cos\phi} \cdot \frac{-2V^2 - 3V^2\cos\phi + 1}{1-V^2} \quad 10.$$

for second-order directional focusing of the special sector field (4).

3,967,117

PHOTOGRAPHIC PROCESS

Lyle Benjamin Borst, 17 Twin Bridge Lane, Williamsville, N.Y. 14221

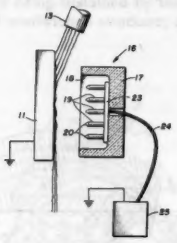
Filed Apr. 18, 1975, Ser. No. 569,535
Int. Cl.² G03B 41/16
U.S. Cl. 250—323 27 Claims

1. A method for obtaining an image of increased density from a first photographic emulsion having silver grains comprising the steps of:
a. depositing a secondary element at the position of said silver grains in said first photographic emulsion;
b. transferring the image of said first photographic emulsion to a second photographic emulsion by exposure of said second photographic emulsion two radiations emitted by said secondary element; and
c. developing said second photographic emulsion to obtain an autoradiograph having an image of increased density.

3,967,118
METHOD AND APPARATUS FOR CHARGING A BUNDLE OF FILAMENTS

Ernest M. Sternberg, Chapel Hill, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 29, 1975, Ser. No. 572,800
Int. Cl.² H01T 19/04
U.S. Cl. 250—325 11 Claims



1. The method of forwarding and charging filaments comprising

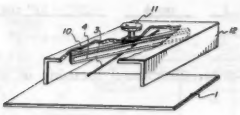
a. forwarding the filaments across the face of a target electrode in a stream of air, said stream of air having a velocity sufficient to form an air sheet on the face of the electrode, and

b. applying an electric field to the filaments in the air sheet to charge said filaments, wherein said electric field is generated from a plurality of locations arranged along a line extending in the direction of filament travel.

3,967,119
CORONA CHARGING DEVICE

Seiji Matsumoto, Asaka, Japan, assignor to Rank Xerox Ltd., London, England

Filed July 16, 1974, Ser. No. 489,011
Claims priority, application Japan, Dec. 30, 1970, 45-122493
Int. Cl.² G03G 15/02
U.S. Cl. 250—326 6 Claims



1. A corona charging apparatus for applying electrostatic charge to a charge surface including:

a corona electrode disposed along a line in spaced relation to said charge surface and operatively connected to a source of voltage for the creation of corona and corona current to accumulate electrostatic charge on said charge surface

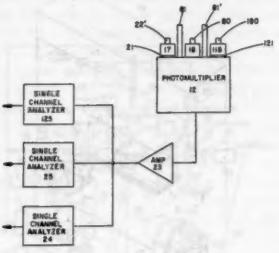
a control wire disposed along a line in spaced relation to said corona electrode and at an oblique angle relative thereto so that successive increments of said control wire along the length thereof are differently spaced from said corona electrode, said control wire being selectively operatively connected to a source of voltage and to ground,

whereby the presence of said control wire at varying distance from said corona electrode exerts variable effect on the corona current flowing therefrom to correspondingly vary the charge density on said charge surface.

3,967,120
ANALYZING RADIATION FROM A PLURALITY OF SOURCES

John B. Ashe; Peter F. Berry, and James D. Hall, all of Austin, Tex., assignors to G. D. Searle & Co., Skokie, Ill.

Division of Ser. No. 366,488, June 4, 1973, Pat. No. 3,859,525.
This application Dec. 5, 1974, Ser. No. 529,858
Int. Cl.² G01T 7/08
U.S. Cl. 250—328 6 Claims

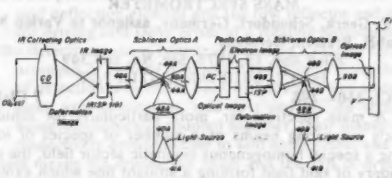


1. In a radiation detection apparatus utilizing a plurality of scintillators for concurrently detecting radiation from a plurality of radioactive samples wherein a single scintillator is associated with each such sample, the improvement comprising a single photodetector in optical communication with all of the scintillators, classes of light filters associated with at least all but one of the scintillators with the filters of each class being positioned between the photodetector and a single scintillator and uniformly attenuating incident light energy within a class by at least 10% and wherein the attenuation of each class of filters differs from the attenuation of each other class of filters by at least 10%, and separate signal analyzers are associated with a single one of the aforesaid scintillators and are connected to said photodetector for contemporaneously accepting electrical pulses in separate predetermined amplitude ranges, a first of the signal analyzers being adjusted to accept electrical pulses in an energy range resulting from scintillations in an associated one of the scintillators, while others of the signal analyzers are adjusted to accept electrical pulses having amplitudes corresponding to the energy range of the first signal analyzer, but varying therefrom to the extent that the attenuation of the associated light filter differs from the attenuation of the light filter associated with the scintillator which is associated with said first signal analyzer.

3,967,121
LOW LEVEL INFRARED CAMERA (LLIR CAMERA)

Charles M. Redman, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 10, 1975, Ser. No. 612,054
Int. Cl.² H01J 31/49; G03B 41/00
U.S. Cl. 250—330 9 Claims



1. A camera for recording low level infrared images comprising:

input optic means for receiving infrared radiation from an object and forming an infrared image of said object;

first storage plate means for receiving said infrared image at an input face thereof and storing said image on a deformographic film on an output face thereof;

first Schlieren optic means for converting said image on the deformographic film of said first storage plate means to a first visible light image;

photocathode means for converting said first visible light image to a corresponding electron image;

second storage plate means for receiving said electron image on an input face thereof and storing an image corresponding to said electron image on a deformographic film on an output face thereof; and

second Schlieren optic means for converting said image on the deforomographic film of said second storage plate to a second visible light image and projecting said second visible light image onto a photographic film.

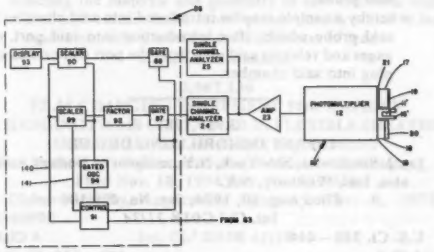
3,967,122
RADIATION ANALYZER UTILIZING SELECTIVE ATTENUATION

John B. Ashe; Peter F. Berry, and James D. Hall, all of Austin, Tex., assignors to G. D. Searle & Co., Skokie, Ill.

Division of Ser. No. 366,488, June 4, 1973, Pat. No. 3,859,525. This application Dec. 5, 1974, Ser. No. 529,857

Int. Cl.² G01T *1/20*

U.S. Cl. 250—367 **3 Claims**



1. In a radiation detection apparatus utilizing a plurality of scintillators, the improvement comprising the arrangement of said scintillators in a radiation detection plane, a single photodetector for generating electrical pulses and having a photosensitive surface parallel to said radiation detection plane in optical communication with the scintillators, a light filter for uniformly attenuating incident light energy by at least 10 percent positioned between the photodetector and at least one and less than all of said scintillators, a first signal analyzer connected to said photodetector for accepting electrical pulses in a predetermined amplitude range generated by radioactive events occurring proximate to said radiation detection plane, and a second signal analyzer connected to said photodetector and set to accept contemporaneous electrical pulses having amplitudes falling with the aforesaid predetermined energy range but diminished by the amount by which the aforesaid light filter attenuates incident light energy and likewise generated by radioactive events occurring proximate to said radiation detection plane.

3,967,123
COUPLING TWO OPTICAL WINDOWS

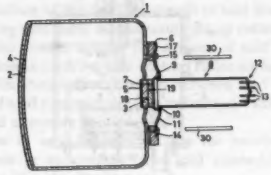
Hendrik Gerardus Deylius; Jan Frederik Lammers, and Antonius Paulus Notenboom, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 28, 1974, Ser. No. 484,077

Claims priority, application Netherlands, July 5, 1973, 7309383

Int. Cl.² H01J *31/50*

U.S. Cl. 250—368 **9 Claims**



1. An image sensing system in which an image-forming apparatus is coupled with a sensing apparatus, comprising said sensing apparatus having an optical window, said image forming apparatus having an optical window that is optically coupled with said optical window of said sensing apparatus, and a diaphragm member disposed at said windows and so coupling said windows by elastic pressure.

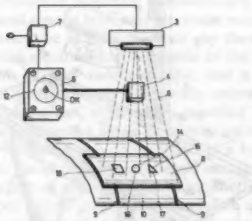
3,967,124
APPARATUS FOR DETERMINING SKIN TOLERANCE TO ULTRA-VIOLET RADIATION

Ernst Strutz, Zurich, Switzerland, assignor to Biviator S.A., Grenchen, Switzerland

Filed Aug. 26, 1975, Ser. No. 607,923

Int. Cl.² G01J *1/42*

U.S. Cl. 250—372 **10 Claims**



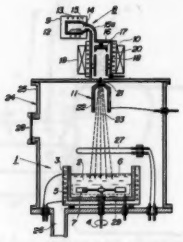
1. An apparatus for determining the tolerances of skin to UV radiation, comprising a UV radiation source and a device for measuring the UV radiation, wherein the UV radiation source and the device for measuring the UV radiation are adapted to be switched on for a predetermined period, so that radiation from the UV source acts on the skin of a test person, a mask being provided between the UV source and the skin, said mask defining at least three apertues and means for the control of the radiation flux through each of said apertures.

3,967,125

METHOD AND APPARATUS FOR MAKING PHOSPHORS

Kiyoshi Morimoto; Yukihiko Utamura, both of Mobara, and Toshinori Takagi, Nagaokakyo, all of Japan, assignors to Futaba Denshi Kogyo K.K., Japan

Filed Feb. 24, 1975, Ser. No. 552,607
Claims priority, application Japan, Feb. 22, 1974, 49-20457
Int. Cl.[2] H01J 37/00
U.S. Cl. 250—432 R 5 Claims



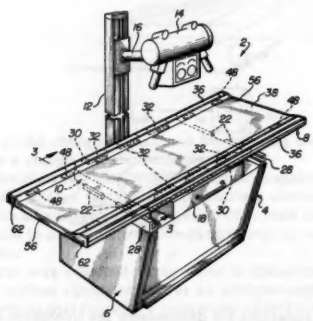
1. An apparatus for preparing phosphor comprising:
an activator ion source section having means for generating activator ions;
an ion accelerating electrode section for accelerating and irradiating activator ions generated by said activator ion source section into base material of said phosphor;
a base activating vessel section having an agitating means for containing the base material of said phosphor and for continuously circulating said base material therein in order to uniformly irradiate accelerated activator ions into said base material of said phosphor; and
a vacuum system for providing a low-pressure atmosphere for at least said activator ion source section and said base activating vessel section.

3,967,126

X-RAY APPARATUS HAVING TABLE WITH IMPROVED TOP

George W. Otto, Jr., Elmhurst, Ill., assignor to American Radiologic Systems Inc., Melrose Park, Ill.

Filed Feb. 20, 1975, Ser. No. 551,370
Int. Cl.[2] G01N 21/00
U.S. Cl. 250—439 7 Claims



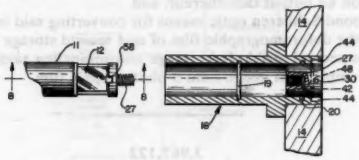
5. In an X-ray apparatus having table with a table top and wherein there is an X-ray film carrier below the table top and an X-ray source above the table top, an improvement in the table top comprising an elongated panel parallel to the film plane of the film carrier and having transverse margins, and means imposing continuous transverse tension on said panel, said means comprising end frame structure at said transverse margins that apply forces in opposite directions on said panel transversely thereof.

3,967,127

SAMPLE INTRODUCER

John F. Rendina, Boxborough, and Paul E. Larson, Acton, both of Mass., assignors to GCA Corporation, Bedford, Mass.

Filed July 3, 1975, Ser. No. 592,807
Int. Cl.[2] H01J 37/20
U.S. Cl. 250—441 6 Claims



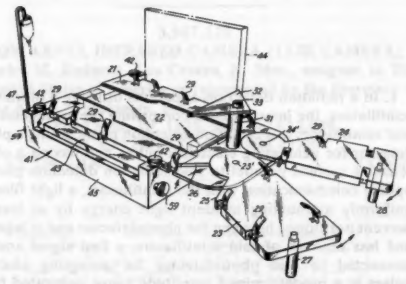
1. Apparatus for introducing a sample into an evacuated chamber through a port in said chamber, said apparatus comprising:
a plug adapted to releasably engage and seal said port at its inner end;
a sample-carrying probe adapted to extend through said port, there being sealing means for maintaining a seal to said port around said probe upon introduction of the probe into said port; and
coupling means at the distal end of said probe for selectively engaging and carrying said plug, said plug being releasable from said port and re-engagable with said port by said probe,
whereby a sample may be introduced into said chamber by said probe which, after introduction into said port, engages and releases said plug from the port and carries said plug into said chamber.

3,967,128

INFANT IMMOBILIZING DEVICE

Jan J. Smulewicz, New York, N.Y., assignor to Nuclear Associates, Inc., Westbury, N.Y.

Filed Aug. 20, 1974, Ser. No. 499,100
Int. Cl.[2] G01N 21/34
U.S. Cl. 250—444 4 Claims



1. An infant immobilizing device comprising a frame for support by a horizontal surface, a body panel, restraining means for releasably restraining an infant on said body panel, means cooperating between said body panel and said frame for removably and adjustably securing said body panel to said frame with the infant oriented substantially horizontally and with the infant oriented substantially vertically, and cassette support means carried by said body panel for vertically sup-

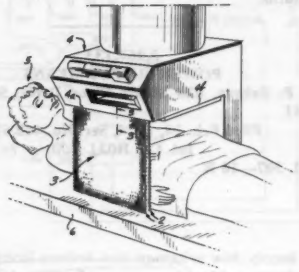
porting an X-ray film cassette in relation to the infant when the infant is oriented substantially vertically.

3,967,129

RADIATION SHIELDING CURTAIN

Norlin T. Winkler, Rochester, Minn., assignor to Research Corporation, New York, N.Y.

Filed Apr. 28, 1075, Ser. No. 571,931
Int. Cl.² G21B *3/02, 3/04*
U.S. Cl. 250—517 **12 Claims**



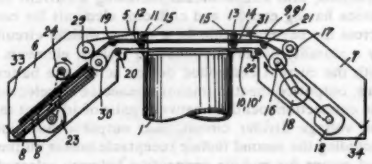
1. A method of constructing a radiation shield comprising the steps of:
   assembling a plurality of radiation-shielding elements;
   connecting said elements in sets to form a plurality of elongated strings of said elements;
   disposing the upper ends of said strings adjacent to each other to form a stranded curtain; and
   selecting the material and geometry of said elements such that said curtain has a cross-section density which is the equivalent of a predetermined thickness of lead.

3,967,130

FILM CHANGING EQUIPMENT FOR RAPIDLY CHANGING FILMS CONTAINED IN FLEXIBLE SHEATHS IN RADIOLOGICAL X-RAY EQUIPMENT

Kurt Decker, 17, Pohlmannstrasse, 8 Munich 42, Germany

Filed Nov. 18, 1974, Ser. No. 525,044
Claims priority, application Germany, Dec. 6, 1973, 2360898
Int. Cl.² G03B *41/16*
U.S. Cl. 250—468 **8 Claims**



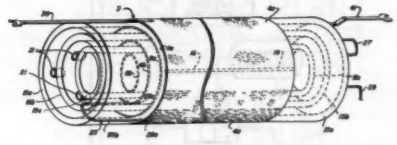
1. A device for rapidly changing a plurality of film sheaths in radiological x-ray equipment, each sheath comprising a length of flat plastic tubing closed at opposite ends and containing a film and a reinforcing foil sufficiently stiff to maintain the film flat during exposure, said device comprising
   a. an exposure section and magazine and delivery sections in communication with said exposure section at opposite sides respectively of said exposure section;
   b. conveyor means including at least two rollers adjacent each of said opposite sides of said exposure section, the peripheral surfaces of said rollers on each of said sides being adjacent each other, at least one pair of endless conveyor belts transparent to x-rays extending across said exposure section between a pair of said rollers at opposite sides respectively of said exposure section such that a run of one of said belts is in confronting relationship with a run of the other of said belts for retaining and transporting said film sheaths in succession therebetween, and drive means for said conveyor means;
   c. means in said magazine section for supporting a stack of said film sheaths and means for feeding said film sheaths in succession to the nip between said rollers at one side of said exposure section said means for supporting a stack of said film sheaths in said magazine section comprising a pivotally mounted table for supporting said stack of film sheaths, a pickup roller positioned for contact with the top surface of the top film sheath of said stack, means for pivoting said table toward said pickup roller to press said top film sheath against the surface of said pickup roller and means to drive said pickup roller to feed successive top film sheaths into the nip between said rollers at one side of said exposure section to transport said film sheaths to said exposure section; and
   d. means in said delivery section for receiving said film sections in succession from said conveyor means and storing film sheaths in a stack.

3,967,131

CORONA DISCHARGE OZONE GENERATING UNIT

Romuald E. Slipiec, Northbrook, and Ronald A. Schultz, Berkeley, both of Ill., assignors to Ozone Incorporated, Deerfield, Ill.

Filed June 4, 1974, Ser. No. 476,333
Int. Cl.² C01B *13/11*
U.S. Cl. 250—539 **11 Claims**



1. In an ozone generating unit including an enclosure forming a passageway for the flow of an oxygen containing gas to be ozonized, a first dielectric tube in said passageway which first tube has an electrode receiving portion with a substantially even thickness and a cylindrical inner surface, an outer cylindrical conductive electrode concentrically mounted on the ouside of and spaced from said electrode receiving portion of said dielectric tube to provide an air gap therebetween, an inner cylindrical electrode on the inside of the electrode receiving portion of said dielectric tube, and a pair of high voltage connecting terminals electrically connected respectively to said electrodes, there being provided between said outer and inner electrodes an air gap where an ozone producing corona is produced upon connection of a high voltage to said terminals, the improvement wherein said inner electrode is made of a sheet of resilient flexible conductive material of a width of about but no greater than the inside circumference of the interior surface of said electrode receiving portion of said dielectric tube and expanding into even continuous contact with the cylindrical inner surface of said dielectric tube so the ends of said resilient flexible sheet of conductive material forming said inner electrode are in even contiguous confronting relation, to provide an even spacing between said electrodes.

6. An ozone generating unit comprising: an enclosure forming a passageway for the flow of an oxygen containing gas to be ozonized, an assembly of concentric dielectric tubes in said passageway spaced from one another to provide for gas flow through the spaces between the dielectric tubes, the end of said dielectric tube assembly into which the gas to be ozonized

flows terminating at different points located progressively axially inwardly of the dielectric tube assembly proceeding from the outermost to the innermost dielectric tubes, so the oxygen containing gas can progressively strike only one tube edge at a time to minimize resistance to gas flow into the dielectric tube assembly, a pair of metal electrodes on opposite sides of each dielectric tube, and a pair of high voltage connecting terminals respectively electrically connected to said pairs of electrodes.

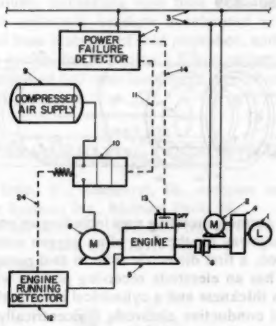
9. In an ozone generating unit including an enclosure forming a pssageway for the flow of an oxygen containing gas to be ozonized, an assembly of concentric dielectric tubes in said passageway spaced from one another to provide for gas flow through the spaces between the dielectric tubes, which spaces include at least one gap in which ozone producing corona discharge is to be produced between electrode receiving portions of adjacent dielectric tubes, and cylindrical electrodes concentrically disposed on opposite sides of said dielectric tubes, the improvement wherein said dielectric tubes are held in centered spaced relation by circumferentially spaced open-ended tubular flexible resilient members sandwiched in partial compression between the dielectric tubes at the opposite ends of the dielectric tube assembly so gas can flow therethrough.

3,967,132

AIR OPERATED POWER TRANSFER APPARATUS

Bruce N. Takamine, 685 Iwalani St., Hilo, Hawaii 96720

Filed Nov. 26, 1974, Ser. No. 527,489
Int. Cl.² F02D *25/00*; F02N *11/08*
U.S. Cl. 290—4 R **23 Claims**



1. In a power transfer apparatus having a stand-by engine to meet a demand for power during a failure in the normal electrical power supply to a load, an engine starting and control means to start the engine upon failure of the normal power supply, run the stand-by engine during the power failure with the engine coupled to the load, and stop th stand by engine when the normal power supply is restored comprising:

a. a compressed air supply;

b. a compressed air starter motor operatively connected to the stand-by engine to drive the engine for starting;

c. a starter valve means operatively connecting the compressed air supply with the compressed air starter motor so that when the valve means is open air can flow from the air supply to the starter motor;

d. a power failure detector operatively connected to the normal electrical power supply;

e. means connecting the power failure detector to the starter valve means for opening the starter valve means upon failure of the normal power supply;

f. an engine running detector operatively connected to the stand-by engine for determining whether the engine is running;

g. means connecting the engine running detector to the startr valve means for closing the valve when the engine is running;

h. a two position engine operation switch operatively connected to the stand-by engine having an "on" position for allowing the engine to run and an "off" position for preventing the engine from running; and

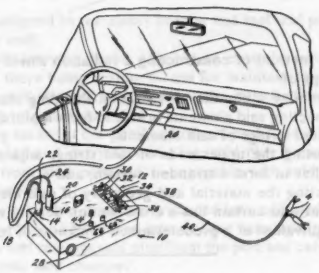
i. means operatively connecting the power failure detector to the engine operation switch so that the switch will be "on" during power failure and "off" when normal power is available so that the engine may be started and run when power fails and will be shut off when normal power returns.

3,967,133

POWER SUPPLY MEANS

James F. Bokern, 828 Mason Wood Drive, St. Louis, Mo. 63141

Filed Feb. 14, 1974, Ser. No. 442,674
Int. Cl.² H02J *1/00*
U.S. Cl. 307—10 R **14 Claims**

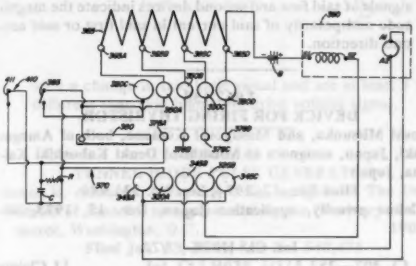


1. Means for providing power at different preselected voltages from a D. C. source such as from a storage battery of the type used with internal combustion engines comprising a battery source having output terminals at which the battery voltage is available, a housing having first, second and third female receptacle connection means thereon and circuit means in the housing, means including said female connection means connecting the circuit means to the battery output terminals, said circuit means including a current controlled device having emitter and collector elements for connection across the battery terminals, a voltage divider circuit formed by a plurality of series connected resistor elements in series with the current controlled device across the battery terminals, output connection means connected to selected ones of the connection locations between pairs of adjacent resistors in the voltage divider circuit, said output connection means including the second female receptacle means on the housing and means for making connection between selected ones of said second receptacle means and the connection locations depending upon the desired voltage, and other means operatively connected in the circuit means including means operative in response to the battery voltage falling below a predetermined voltage to simultaneously discontinue the supply of power from the battery to the voltage divider circuit and to a load connected across a portion thereof, said last named means also including means which are deenergized when the voltage falls below the predetermined level to indicate the occurrence of this condition, said indicating means being mounted on said housing means, said third female receptacle means including means for making another output voltage available.

3,967,134
ELECTRICAL CONTROL APPARATUS

James Whitman Gibbs, Hialeah, Fla., assignor to Flo-Start, Inc., Akron, Ohio

Filed Jan. 15, 1975, Ser. No. 540,430
The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.
Int. Cl.² H01H 19/14
U.S. Cl. 307—115 42 Claims

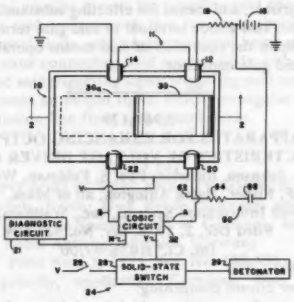


1. An electrical control unit operative with circuit means comprising, slide surface means composed in part of electrically non-conductive material, a plurality of conductive discrete contact means arranged in said slide surface means, first conductive liquid contact means progressively and successively engaging some of said discrete contact means and connected to said circuit means to provide a variable magnitude electrical output and second conductive liquid contact means engaging other of said discrete contact means and connected to said circuit means to effect a switching operation with respect to the electrical output of said first liquid contact means.

3,967,135
ACCELERATION CHANGE SENSOR

Morton S. Balban, and Doublas A. Larson, both of Oak Park, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 11, 1974, Ser. No. 460,009
Int. Cl.² B60Q 1/00
U.S. Cl. 307—121 20 Claims



1. A device for indicating the occurrence of rates of change of velocity of a body, equal to and greater than a predetermined minimum, comprising:

a. a base fixed to the body;

b. an inertial mass movable with respect to said base and having a reference position, and means biasing said mass to said reference position, said mass being movable to overcome the biasing force and move to a second position when the body is subjected to rates of change of velocity equal to and greater than the predetermined minimum;

c. a light source attached to said base;

d. a first light responsive means attached to said base and disposed to be out of light communication with said light source when said mass is in said reference position and to receive light from said light source when said mass is in said second position;

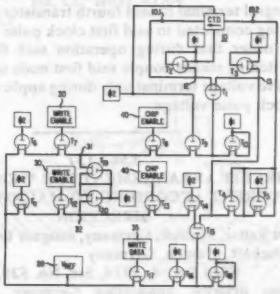
e. a second light responsive means attached to said base disposed to be out of light communication with said light source when said mass is in said second position and to receive light from said light source when said mass is in said reference position; and

f. electric circuit means connected to said first and second light responsive means operative to indicate the status of both said first and second light responsive means.

3,967,136
INPUT CIRCUIT FOR SEMICONDUCTOR CHARGE TRANSFER DEVICE CIRCULATING MEMORY APPARATUS

Robert Harold Krambeck, South Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 7, 1974, Ser. No. 477,193
Int. Cl.² H01L 27/10, 29/78; G11C 11/40
U.S. Cl. 307—221 D 8 Claims



1. A circulating memory semiconductor apparatus which comprises:

a. a semiconductor charge transfer device having an input terminal and an output terminal, said charge transfer device for shifting charges representing information in response to at least first and second clock pulse voltages of different relative phases;

b. a write-enable network for modifying information circulating in said charge transfer device, said write-enable network including a plurality of transistor switching means, each said transistor switching means having first and second high current carrying terminals and a control terminal, current flow between said first and second high current carrying terminals being controlled by signals applied to the respective control terminals, said plurality of transistor switching means including

a first transistor switching means having its first and second high current carrying terminals connected in series between the input terminal and the output terminal of said charge transfer device, such that during operation information signals from said output terminal are decoupled from said input terminal upon application of a suitable first control signal applied to the control terminal of said first transistor switching means and that said information signals from said output terminal are coupled to said input terminal only upon absence of said first control signal to the control terminal of said first transistor switching means, said write-enable network further including second and third transistor switching

means for supplying said first control signal to the control terminal of said first transistor switching means only during application of said second clock pulse voltage, the first and second high current carrying terminals of said second and third transistor switching means being connected in series between said control terminal of said first transistor switching means and a reference terminal for connection to a voltage source, such that said second and third transistor switching means supply said first signal to the control terminal of said first transistor switching means only upon simultaneous application of suitable second and third control signals to the control terminals respectively of said second and third transistor switching means; and

c. fourth transistor switching means, having first and second high current carrying terminals and a control terminal, for preventing application of said first control signal to the control terminal of said first transistor switching means upon sequential, rather than simultaneous, application of said second and third signals to the control terminals of said second and third transistor switching means, the first and second high current carrying terminals of said fourth transistor switching means being coupled in series between a first clock pulse voltage terminal connected to a source of said first clock pulse voltage and a first node along the series path between said reference terminal and said control terminal of said first transistor switching means, said first node being located between said second and third transistor switching means, the control terminal of said fourth transistor switching means being connected to said first clock pulse voltage terminal in order that during operation said fourth transistor switching means couple said first node to said first clock pulse voltage terminal only during application of said first clock pulse voltage.

3,967,137

CIRCUIT ARRANGEMENT FOR WEIGHTING A CURRENT ACCORDING TO MAGNITUDE AND DIRECTION

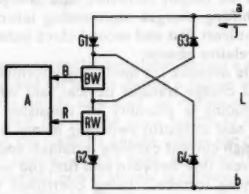
Herbert Reiter, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 4, 1974, Ser. No. 529,492

Claims priority, application Germany, Dec. 4, 1973, 2360375

Int. Cl.² H03K *5/153, 5/20;* **H04M** *3/30*

U.S. Cl. 307—235 R **2 Claims**



1. A circuit for providing a code defining the magnitude and direction of a current on a line, comprising

first and second current responsive devices connected in series, each of said devices providing a predetermined binary signal in response to the current on said line,

said first current responsive device comprising means for establishing a threshold, whereby the binary output signal of said first device comprises information defining the relative magnitude of the current through said device as compared to said threshold,

said second current responsive device providing the binary signal indication of the direction of current on said line,

first rectifier means connecting said current responsive devices between the wires of said line, said rectifier means being poled to pass only the current of a first predetermined direction on said line to said current responsive devices,

and second rectifier means oppositely poled with respect to said first rectifier means and connected to pass current to said first current responsive device while bridging said second current responsive device, whereby only said first device is responsive to the current in the second direction opposite to said first direction, whereby the binary output signals of said first and second devices indicate the magnitude and polarity of said current in said first or said second direction.

3,967,138

DEVICE FOR FIRING THYRISTOR

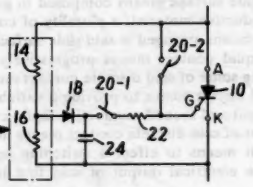
Hiroshi Mitsuoka, and Masayoshi Kumano, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 12, 1974, Ser. No. 531,984

Claims priority, application Japan, Dec. 15, 1973, 48-141091

Int. Cl.² H03K *17/72*

U.S. Cl. 307—252 J **11 Claims**



1. A device for firing a thyristor, comprising; a thyristor to be fired including an anode terminal, a cathode terminal and a gate terminal, a gate capacitor capable of charging with a voltage applied across said anode terminal and said cathode terminal of said thyristor, means for charging said gate capacitor with said voltage, means operable for connecting said gate capacitor across said gate terminal and said cathode terminal of said thyristor, and means for effecting substantially a short-circuit from said anode terminal to said gate terminal of said thyristor upon the operation of said means operable for connecting said gate capacitor.

3,967,139

APPARATUS FOR ENHANCING OUTPUT CHARACTERISTICS OF VOLTAGE DRIVER CIRCUITS

Robert B. Johnson, Billerica; Paul S. Feldman, Waltham, and Edwin P. Fisher, North Abington, all of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Dec. 2, 1974, Ser. No. 528,599

Int. Cl.² H03K *17/00*

U.S. Cl. 307—270 **3 Claims**

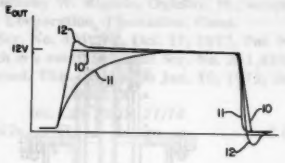
1. Driver circuit comprising:

first means for receiving a high-level drive voltage signal;

gating means for receiving a plurality of low-level input signals and for generating a logic signal corresponding to a logical function of said plurality input signals; and

second means coupled to said gating means and responsive to a change in said logic signal for generating a high-level output signal, said second means including a phase splitting transistor with its base connected to receive said logic signal and inductive means coupled between said first means and the collector of said phase splitting transistor for converting said high-level drive voltage signal to

an internal signal which includes higher level voltage segments which appear substantially time coincidentally with a change in said logic signal and are at least 3 volts different than said high-level drive voltage signal.



3,967,140

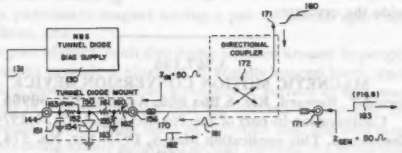
TUNNEL DIODE PULSE GENERATOR

James R. Andrews, Lafayette, Colo., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Jan. 13, 1975, Ser. No. 540,471

Int. Cl.² H03K 3/315

U.S. Cl. 307—286 **7 Claims**



1. A tunnel diode pulse generator, comprising:
a transmission line;
a tunnel diode;
bias means biasing said tunnel diode;
means connecting said tunnel diode across said transmission line, said means including an impedance matching network matching the characteristic impedance of said transmission line;
means supplying triggering signals; and
directional coupler means for coupling said triggering signals to said transmission line for transmission towards said tunnel diode, said triggering signal being received by said means connecting said tunnel diode without reflection and said triggering signal triggering said tunnel diode to generate an output signal which propagates down said transmission line from said tunnel diode.

3,967,141

PIEZOELECTRIC ENERGY SOURCE

Heinz Gawlick, Furth; Uwe Brede, Schwaig, and Hellmut Bendler, Erlangen-Spardorf, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

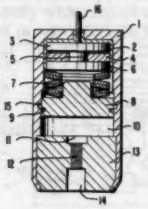
Filed Nov. 3, 1971, Ser. No. 195,431

Claims priority, application Germany, Dec. 1, 1970, 2058968

Int. Cl.² H01L 41/08

U.S. Cl. 310—8.7 **16 Claims**

1. A piezoelectric energy source comprising a housing, a piezoelectric transducer arranged within said housing, piston means mounted for movement within said housing for exerting pressue on said piezoelectric transducer in accordance with the extent of the path of movement thereof from an initial rest position, and means for nondisengagingly locking said piston means in a predetermined position along the path of movement of said piston means corresponding to a predetermined pressure on said piezoelectric transducer, said piezoelectric transducer providing an output in accordance with the pressure exerted thereon, and said housing forms a portion of a capacitor for storing the output of said piezoelectric transducer.



3,967,142

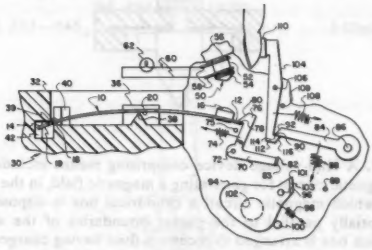
PIEZOELECTRIC CRYSTAL FIRING SPRING AND MOUNT

David Easton Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 6, 1975, Ser. No. 538,673

Int. Cl.² H01L 41/04

U.S. Cl. 310—8.3 **6 Claims**



1. A piezoelectric crystal striking mechanism comprising:
means, including a member movable between a latched position and a striking position, for striking a piezoelectric crystal;
means for mounting said striking means, said mounting means including a pair of fulcrum edges that are engageable with said striking means to support said member for movement between said latched and striking positions; and
means for releasably retaining said member in said latched position.

3,967,143

ULTRASONIC WAVE GENERATOR

Akinori Watanabe; Katsuhide Tanoshima; Takeo Ando; Akira Tohama, and Akio Nagano, all of Tokyo, Japan, assignors to Oki Electric Industry Company, Ltd., Tokyo, Japan

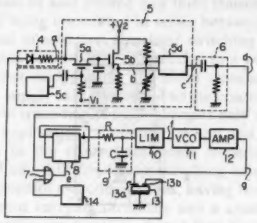
Filed Oct. 10, 1974, Ser. No. 513,752

Int. Cl.² H01L 41/04

U.S. Cl. 310—8.1 **4 Claims**

1. An ultrasonic wave generator comprising at least a transducer for generating an ultrasonic wave having at least a driving electrode and a detection electrode, a variable frequency oscillator whose output signal is applied to said driving electrode, and a slope detection circuit which detects the

amplitude of the output signal of said detection electrode and controls the output frequency of said variable frequency oscillator for obtaining the maximum amplitude of output signal in said detection electrode.

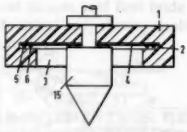


3,967,144

HALL-VOLTAGE DEVICE

Ferdinand Hubert Franciscus Gerardus Spierings, Asserpark 11, Wageningen, Netherlands

Filed May 19, 1975, Ser. No. 579,084
Int. Cl.² G21D 7/02
U.S. Cl. 310—10 **5 Claims**



1. A Hall-voltage device comprising means included in a magnetic circuit for generating a magnetic field, in the air gap of which magnetic circuit a cylindrical box is disposed substantially parallel to the planar boundaries of the air gap, which box is arranged to receive a fluid having charged particles distributed therein and which box includes electrodes adapted to cooperate with the fluid, and means for imparting to the box a rotational movement about its axis, which axis substantially coincides with the central axis of the magnetic circuit, one end face of the box being provided with a central aperture, characterized by an electrode support consisting of a thin, flexible disc of plastic foil of a diameter slightly less than the inside diameter of the box, on which disc both the electrodes and their discharge conductors are disposed and which disc includes a raidal cut so as to permit insertion of the disc into the box through the central aperture, the disc being kept in its proper position within the box by means of a pivot extending through the aperture and having terminals to which the discharge conductors extend.

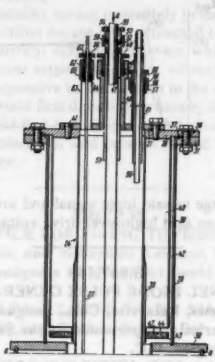
3,967,145

CONTACTLESS SYNCHRONOUS ELECTRIC MACHINE

Voldemar Voldemarovich Apsit, ulitsa V. Latsisa, 2a, kv. 21; Zigurd Karlovich Sika, Vaidavas, 27, kv. 40, and Daniel Petrovich Kikust, ulitsa Bikernieku, 81, kv. 34, all of Riga, U.S.S.R.

Filed June 24, 1974, Ser. No. 482,598
Int. Cl.² H02K 9/00
U.S. Cl. 310—52 **5 Claims**

1. A contactless synchronous electric machine comprising: a stator carrying an armature w/inding made of a superconducting material; a rotor provided with claw-shaped pole systems coaxially encasing the stator; said rotor being attached with one of its ends to a shaft transmitting rotary motion thereto; a field winding made from a superconducting material being connected to said stator; a cryostat immovably disposed within the rotor pole systems and coaxially encircling the stator; said armature winding and field winding being secured inside the cryostat.

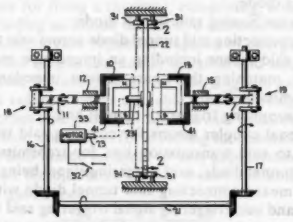


3,967,146

MAGNETIC MOTION CONVERSION DEVICE

Gerald T. Howard, Rte. 6 Box 606, Augusta, Ga. 30906

Continuation-in-part of Ser. No. 463,685, April 24, 1974, abandoned. This application May 5, 1975, Ser. No. 574,457
Int. Cl.² H02K 7/06
U.S. Cl. 310—80 **7 Claims**

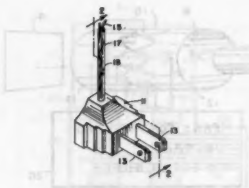


1. A motor comprising at least one first magnet and at least one second magnet disposed with like poles facing one another, at least one of said first and second magnets being shiftable in a reciprocating motion relative to the other of said magnets, a magnetic flux field suppressor moveably mounted between said magnets, said suppressor comprising at least one disc having a first portion of non-magnetic material and a magnetically permeable second portion comprising a plurality of magnetic conducting sheets interleaved with thin layers of a non-magnetic material, first means including a crankshaft connecting said one magnet to a drive shaft, second means connecting said disc to a power source to effect driving movement of said disc, whereby repeated movement of said first and second portions of said disc into alignment between like poles of said magnets causes them to be repeatedly repulsed from each other and attracted to the disc to thereby shift said one magnet relative to said other magnet, the magnetic flux lines of said magnets being focused during the attracting action by said sheets as they are directed therethrough between the poles of each said magnet so that said magnets are attracted to the disc and not to each other.

3,967,147
LOW POWER SYNCHRONOUS MOTOR AND LINE CORD THEREFOR

Ralph H. Preiser, LaSalle, Ill.; Frank W. Stellwagen, Stamford, Conn., and Anthony W. Rigazio, Oglesby, Ill., assignors to General Time Corporation, Thomaston, Conn.

Division of Ser. No. 405,550, Oct. 11, 1973, Pat. No. 3,873,865, which is a continuation of Ser. No. 261,485, June 9, 1972, abandoned. This application Jan. 10, 1975, Ser. No. 540,177
Int. Cl.² H02K 21/14
U.S. Cl. 310—162 5 Claims



1. In combination with a timepiece, a synchronous motor comprising:

a. a rotor including

1. a permanent magnet having a pair of spaced apart surfaces, and

2. a pair of discs, each disc being notched around its periphery to provide a plurality of equally spaced teeth, each disc being mounted on a respective surface of said magnet in a position such that the notches in one disc are axially opposite the teeth in the other disc and said magnet being axially polarized so that one disc is a north pole and the other disc a south pole;

b. a stator including

1. an energizing winding,

2. a core passing through said winding and,

3. a pair of plates of like configuration having first and second portions, each said second portion extending longitudinally and on one side of center line through said first portion, each said second portion having a notched substantially semi-circular cut-out located towards said center line, said plates secured by said first portions to said core at opposite ends of said winding such that said second portions are located on opposite sides of said center line, said second portions being bent oppositely about two substantially right angle bends so that a major length of said second portion is disposed in a common plane between and parallel to the planes of said first portions whereby said notched cut-outs define a plurality of pole pieces;

c. means rotatably supporting said rotor within said pole pieces for rotation under influence of said energizing winding, said rotor support means providing mechanical connection to a movement of said timepiece to drive said movement under control of said energizing winding; and

d. means for conveying electrical energy from a source to said energizing winding, said conveying means including means for limiting continuously the flow of current under fault conditions to a non-hazardous level.

3,967,148
BRUSH HOLDER ASSEMBLY

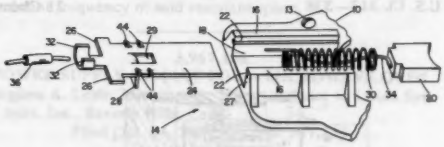
Richard S. Walsh, Foxboro, Miss., assignor to Ark-Les Switch Corporation, Watertown, Mass.

Filed Jan. 30, 1975, Ser. No. 545,760
Int. Cl.² H02K 13/00
U.S. Cl. 310—239 11 Claims

1. A brush holder for use with an electrical motor having a commutator comprising:

a brush supporting and guiding element for supporting and guiding a motor brush for radial movement relative to said commutator;

said element comprising a base and wall means together defining an elongated brush supporting and guiding channel extending radially with respect to said commutator with opposed slots in opposite walls thereof;



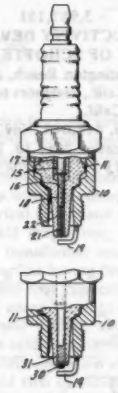
a brush stop surface disposed within said channel adjacent its end remote from said commutator, and;

a metal plate member mounted in said slots and extending therebetween, said plate member defining a wall of said brush guiding channel and having integral wire connection means and retaining means for securing said plate member in said slots.

3,967,149
SPARK PLUG

Carl J. Eaton, Toledo, and Richard S. Podlak, Maumee, both of Ohio, assignors to Champion Spark Plug Company, Toledo, Ohio

Division of Ser. No. 376,524, July 5, 1973, Pat. No. 3,868,530. This application Nov. 6, 1974, Ser. No. 521,182
Int. Cl.² H01T 13/20
U.S. Cl. 313—141 3 Claims



1. The method of manufacturing a spark plug center electrode which comprises flaring the end of a cylindrical wire of non-precious metal, forming a recess in said flared end, inserting a small body of precious metal into said recess, and swaging the parts together to return said flared end to a cylindrical configuration whereby the non-precious metal bites into and undercuts the side walls of said insert intermediate the ends of the insert.

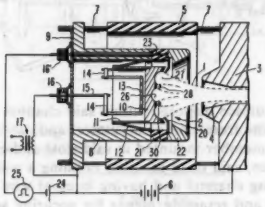
2. The method of manufacturing a spark plug center electrode which comprises forming an axial hole in a wire of non-precious metal and of uniform diameter, filling at least a portion of said hole with an insert of precious metal wire, and swaging the wire parts together to uniformly reduce the diameter of said non-precious metal wire and grip said precious metal wire insert mechanically at its side walls only.

3,967,150

GRID CONTROLLED ELECTRON SOURCE AND METHOD OF MAKING SAME

Erling L. Lien, Los Altos; George V. Miram, Atherton, and Richard B. Nelson, Los Altos Hills, all of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Jan. 31, 1975, Ser. No. 545,867
Int. Cl.² H01J 1/20, 19/14
U.S. Cl. 313—338 21 Claims



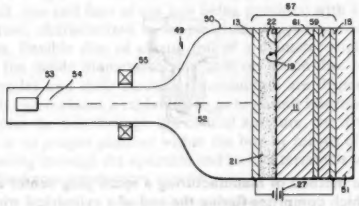
1. A grid-controlled electron source comprising, a thermionic cathode and a control grid spaced adjacent said cathode, said grid comprising multiple apertures separated by conductive members, said cathode having a surface facing said control grid, said surface comprising, electron emissive areas facing said multiple apertures, and non-emissive areas facing said conductive members, said non-emissive areas comprising deposited portions of a layer of non-emissive material on said surface facing said control grid.

3,967,151

SUSTAINED CONDUCTIVITY DEVICE COMPRISING A PLURALITY OF SCHOTTKY BARRIERS

Paul F. Robusto, Huntington Beach, and Craig P. Stephens, Oceanside, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 415,049, Nov. 12, 1973, Pat. No. 3,928,671. This application May 30, 1975, Ser. No. 582,543
Int. Cl.² H01J 29/10, 31/08; H01L 29/48
U.S. Cl. 313—398 8 Claims



1. An electrical field sustained conductivity device comprising:

a. a pair of spaced-apart electrodes and a layer of heat-treated cadmium sulfide between said electrodes;

b. a discontinuous metal layer on one surface of said cadmium sulfide, operative to create Schottky barriers in said surface of the cadmium sulfide; and

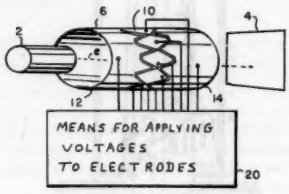
c. an ionizable composite film on said discontinuous metal layer, said composite film having conductive particles dispersed in an oxygen-containing insulating medium.

3,967,152

SIMULTANEOUS ELECTROSTATIC FOCUSING AND DEFLECTION SYSTEM

Rudolf G. E. Hutter, New York, N.Y., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Division of Ser. No. 473,591, May 28, 1974, Pat. No. 3,922,580. This application July 17, 1975, Ser. No. 596,323
Int. Cl.² H01J 29/74, 29/62
U.S. Cl. 313—435 1 Claim



1. An electrostatic electrode system for controlling an electron beam comprising:

A. eight mutually separated electrode segments arranged as cylindrical segments around the surface of an imaginary cylinder of radius R at angular intervals of $\pi/4$, opposite segments being diametrically symmetrical with respect to an axis of the imaginary cylinder,

B. a first cylindrical electrode section of a radius of substantially R having an axis coincident with the axis of the imaginary cylinder, the first section having first extensions at one end thereof at angular intervals of $\pi/4$, the first extensions being interleaved with and insulated from the eight electrode segments, and the first section extending axially away from the first extensions at the one end thereof to a smooth end of the first section at an axially opposite end thereof,

C. a second cylindrical electrode section of a radius of substantially R having an axis coincident with the axis of the imaginary cylinder, the second section having second extensions at one end thereof at angular intervals of $\pi/4$, the second extensions being interleaved with and insulated from the eight electrode segments, and the second section extending axially away from the second extensions at the one end thereof to a smooth end of the second section at an axially opposite end thereof, and

D. means for applying voltages for electrostatic control to the segments and sections of the electrode.

3,967,153

FLUORESCENT LAMP HAVING ELECTRICALLY CONDUCTIVE COATING AND A PROTECTIVE COATING THEREFOR

Howard W. Milke, Danvers, and Tadius T. Sadoski, Salem, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 25, 1974, Ser. No. 526,488
Int. Cl.² H01J 61/30, 61/42, 61/54
U.S. Cl. 313—489 3 Claims

1. A fluorescent lamp comprising a glass envelope having electrodes at each end thereof, a transparent electrically conductive layer coated on the inner surface of the glass envelope, a transparent layer of finely powdered aluminum oxide coated on the electrically conductive coating and a layer of luminescent material coated on the aluminum oxide layer.

3,967,154

MAGNETRON HAVING HORIZONTALLY BLOWN TYPE RADIATOR

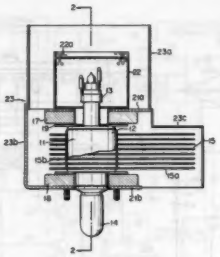
Norio Tashiro, Yokohama, and Hiroshi Miura, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 2, 1975, Ser. No. 538,113

Claims priority, application Japan, Jan. 11, 1974, 49-6787[U]

Int. Cl.² H01J 25/50

U.S. Cl. 315—39.51 7 Claims



1. A magnetron comprising a magnetron body having an anode member, a cathode stem projecting from one end of the anode member, and an antenna section projecting from the other end of the anode member; a pair of permanent magnets oppositely disposed to impart a magnetic field to the magnetron body; a yoke for magnetically coupling the permanent magnets to each other; a radiator mounted on the outer periphery of the anode member of the magnetron body and having a plurality of cooling plates superposed in a direction to intersect the axis of the anode member; and a cooling wind guide having a wind inlet guide receiving a cooling wind blown in an axial direction of the magnetron body from the side of the cathode stem and surrounding the cathode stem and a cooling wind passage disposed in communication with the wind inlet guide in the axial direction of the magnetron body for guiding the cooling wind toward the radiator and an outlet from which the cooling wind passed through the radiator is discharged crosswise of the axis of the magnetron body.

3,967,155

ELECTRONIC FREQUENCY TUNING MAGNETRON

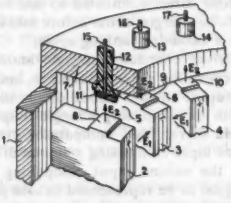
Paul Chavanat; Bernard Epsztein, and Georges Mourier, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 23, 1974, Ser. No. 535,715

Claims priority, application France, Dec. 28, 1973, 73.46957

Int. Cl.² H01J 25/50

U.S. Cl. 315—39.55 12 Claims



1. In a magnetron having the anode cavities of a magnetron oscillator, at least a multipactor element disposed in the resonant space of one at least of said cavities, said multipactor element comprising two parallel electrodes facing each other and capable of emitting secondary electrons with a secondary emission coefficient δ greater than unity, said multipactor element being so dimensioned and positioned in said resonant space that the high frequency electric wave developed in said anode when operating provides between said electrodes of said multipactor element, a high frequency electric field perpendicular to said electrodes and gives reside to the occurrence there of a variable multipactor discharge modifying the resonant frequency of said resonant space.

3,967,156

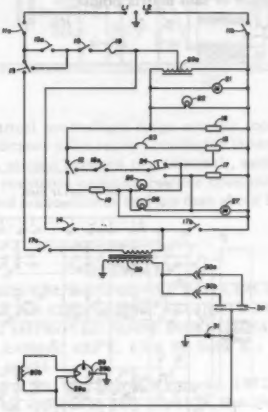
POWER SUPPLY CIRCUIT FOR A MICROWAVE OVEN

Stephen A. Levie, Minneapolis, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 24, 1974, Ser. No. 517,739

Int. Cl.² H05B 9/00

U.S. Cl. 315—101 3 Claims



1. A power supply circuit for a microwave oven adapted to provide constant magnetron output power at either 50Hz or 60Hz input power frequency, said circuit including a magnetron for generating microwave frequency energy; a transformer having a primary winding connected to a source of alternating current electrical power and a secondary winding serially connected to said magnetron; a capacitor serially connected between said transformer secondary winding and said magnetron, said capacitor having first and second selectable capacitive values, said first capacitive value adapted to provide a predetermined energy level to said magnetron during 50Hz operation of said circuit, said second capacitive value adapted to provide said predetermined energy level to said magnetron during 60Hz operation of said circuit; means for selecting either of said first or second capacitive values; and current rectifying means electrically connected in series with said capacitor and in parallel with said mangetron to provide a current path during alternate half-cycles of said alternating current.

3,967,157

DRIVING CIRCUIT FOR A GAS DISCHARGE DISPLAY PANEL

Hiroshi Hada; Tsutomu Hirayama, and Kazunori Nishida, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Jan. 20, 1975, Ser. No. 542,559

Claims priority, application Japan, Feb. 7, 1974, 49-15744

Int. Cl.² H01J 1/53, 11/04; H05B 37/00

U.S. Cl. 315—169 TV 9 Claims

1. A circuit for driving a first electrode group of a gas discharge display panel having a first and a second electrode

group arranged on either side of a gas discharge space including:

a first plurality of PNP transistors, each having an emitter and a collector electrode;

a second plurality of NPN transistors, each having an emitter and a collector electrode;

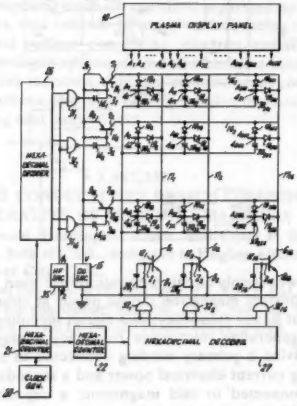
first means for applying a positive voltage to the emitter electrodes of said PNP transistors;

second means for applying a reference potential to the emitter electrodes of said NPN transistors;

a first plurality of conductors, connected to the collector electrodes of said PNP transistors;

a second plurality of conductors, connected to the collector electrodes of said NPN transistors, each of said second conductors intersecting all of said first plurality of conductors to form a plurality of matrix points;

a plurality of forwardly directed diode means one of which is connected between said first and second conductors across each of said matrix points;



connecting means for connecting individual ones of said diode means to the respective electrodes of said one electrode group; and

a capacitor means connected between individual ones of said diode means at each of said matrix points and a point of a substantially constant voltage.

8. A gas discharge display panel including

first and second substantially parallel opposed base plates;

a first group of electrodes formed on said first base plate;

a second group of electrodes formed on said second base plate, in a direction substantially transversely to said first group of electrodes;

an additional electrode formed on said second base plate in a direction substantially transverse to said first group of electrodes;

first dielectric means disposed between said first and second group of electrodes; and

second dielectric means including a block of dielectric material extending along said additional electrode and extending outwardly from said additional electrode to said first group of electrodes.

3,967,158

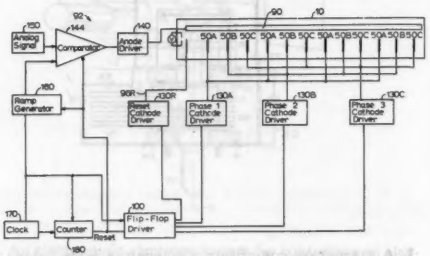
CIRCUIT FOR OPERATING A BAR GRAPH DISPLAY PANEL

Richard A. Saxon, Basking Ridge, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 24, 1975, Ser. No. 543,882

Int. Cl.² H05B 37/00

U.S. Cl. 315—169 TV **1 Claim**



1. A bar graph display system comprising

a display panel comprising a gas-filled envelope including a base plate and a viewing face plate hermetically sealed together,

a plurality of thin, parallel, linear cathodes disposed in a series along the surface of said base plate and positioned sufficiently close together so that, as the series of cathodes is energized and selected cathodes are caused to exhibit cathode glow, the glow of adjacent cathodes appears to blend to form a bar of light, said series of cathodes including a first cathode, a last cathode, and intermediate cathodes,

a reset cathode positioned adjacent to and ahead of the first cathode in said series for use in starting a scanning cycle for said series of cathodes,

an anode electrode disposed on said face plate overlying said series of cathodes,

conductors connected to said cathodes and connecting said cathodes in groups with a single common conductor connected to each such group,

a separate cathode driver connected to each common conductor for energizing each cathode in turn along said series of cathodes,

a reset cathode driver connected to said reset cathode and adapted to be energized first before said separate cathode drivers in a cathode scanning cycle,

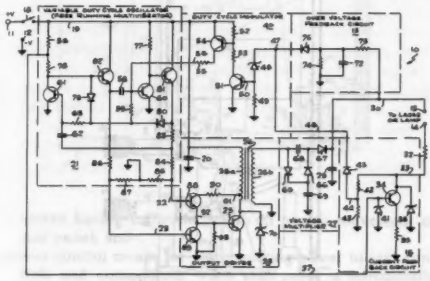
an anode driver connected to said anode electrode for applying operating potential thereto, and

a circuit coupled to said anode driver including a signal comparator circuit having a single output connected to said anode driver, said comparator circuit having two inputs, one input comprising a source of a sawtooth voltage, and the second input comprising a source of an analog signal to be represented in said panel by a bar of light made up of a group of energized cathodes, said cathode drivers continually energizing said cathodes in said series and causing said cathodes to exhibit cathode glow as long as there is an output from said comparator and said anode driver is energized thereby and energizes said anode.

3,967,159
POWER SUPPLY FOR A LASER OR GAS DISCHARGE LAMP

King Hubert Dendy, Panorama City, and Morton B. Leskin, Sherman Oaks, both of Calif., assignors to Morton B. Leskin, Sherman Oaks, Calif.

Filed Feb. 3, 1975, Ser. No. 546,331
Int. Cl.³ G05F 1/44; H05B 41/29
U.S. Cl. 315—247 19 Claims



. 1. In a power supply of the type including a feedback loop to maintain the output current at a substantially constant level, the improvement for providing a first feedback signal that is indicative of the output current drawn from said supply, comprising;

a voltage regulator connected in series with the current return path from the power supply load, and

a resistive network across said voltage regulator, a change in output current drawn from said power supply causing a concomitant change in voltage across said resistive network, said first feedback signal being proportional to said voltage.

10. In a power supply of the type wherein an output voltage is developed across a transformer having a primary winding that is intermittently switched into connection with a source of voltage, said power supply being capable of developing an output voltage level sufficiently high to ignite a load of the type requiring a high ignition voltage and thereafter requiring a much lower operating voltage as current is drawn by the load after ignition, the improvement comprising:

an oscillator having a variable duty cycle, said oscillator controlling the switching of said transformer primary so that said primary is connected to said voltage source for a duty cycle established by the oscillator duty cycle,

duty cycle modulator means for modulating the duty cycle of said oscillator in response to a control voltage,

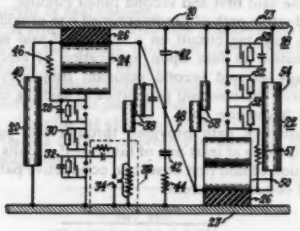
a first feedback circuit, operative only prior to ignition of said load, for providing to said modulator means a first control voltage, which results in a decrease in duty cycle of said oscillator, in delayed response to occurrence of an output voltage from said supply that is above a certain level sufficiently high to ignite said load, said delay being of sufficient time so as to permit said load to be ignited, and

a second feedback circuit, responsive to the output current from said power supply, for providing to said modulator means a second control voltage which causes the oscillator duty cycle to change in inverse proportion to the power supply output current, said duty cycle and hence said output voltage initially being maximum as minimal current is drawn prior to turn-on of said load.

3,967,160
ELECTRICAL OVERVOLTAGE SURGE ARRESTER WITH A LONG TIME CONSTANT VALVE SECTION AND SERIES GAP SECTION

James S. Kresge, Pittsfield, and Harvey E. Fiegel, Richmond, both of Mass., assignors to General Electric Company

Filed May 1, 1975, Ser. No. 573,566
Int. Cl.² H02H 9/06
U.S. Cl. 317—68 9 Claims

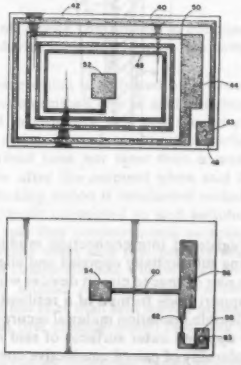


1. An electrical overvoltage surge arrester, comprising a non-linear resistance valve section connected in series with an electrode gap section between two terminals, said valve section having a resistance-capacitance time constant of at least several hundred microseconds and less than about 10 milliseconds.

3,967,161
MULTI-FREQUENCY RESONANT TAG CIRCUIT FOR USE WITH AN ELECTRONIC SECURITY SYSTEM HAVING IMPROVED NOISE DISCRIMINATION

George Jay Lichtblau, 425 E. 63rd St. Suite E - 12-D, New York, N.Y. 10021

Continuation of Ser. No. 262,465, June 14, 1972, Pat. No. 3,863,244. This application July 19, 1974, Ser. No. 490,011
The portion of the term of this patent subsequent to May 7, 1991, has been disclaimed.
Int. Cl.² H02B 1/04, 9/00; G08B 21/00
U.S. Cl. 317—101 R 6 Claims



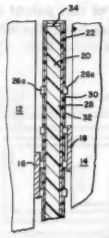
1. For use in an electronic security system which includes means for providing an electromagnetic field of a frequency which is swept within a predetermined range, means for detecting a first frequency within said range, and means for providing an electromagnetic field at a second frequency outside of said range, a multi-frequency resonant tag circuit containing at least first and second tuned circuits respectively resonant at said first and second frequencies comprising:

a planar substrate of electrically insulative material;
a first conductive path formed on a surface of said substrate in a configuration to define a first inductor;
a second conductive path formed on said substrate in a configuration to define a second inductor;
first and second pairs of conductive areas formed on said substrate, each pair having conductive areas in alignment on respective opposite surfaces of said substrate to define a capacitor, the conductive areas on the substrate surface containing said first and second conductive paths being electrically connected to said paths at selected points to define said first and second tuned circuits;
a conductive path of predetermined size provided in circuit with said tag circuit on a surface of said substrate and operative to fuse upon application of electromagnetic energy at said second resonant frequency to thereby destroy the resonant properties of said tag circuit at said first frequency; and
a conductive path provided through said substrate and completing at least one of said tuned circuits by interconnection of said first or second conductive path and one of said conductive areas.

3,967,162
INTERCONNECTION OF OPPOSITELY DISPOSED CIRCUIT DEVICES

Myron Ceresa, Advance, N.C., and Richard Henry Zimmerman, Palmyra, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 491,575, July 24, 1974, abandoned. This application July 23, 1975, Ser. No. 598,452
Int. Cl.² H05K *1/12*
U.S. Cl. 317—101 CM **9 Claims**

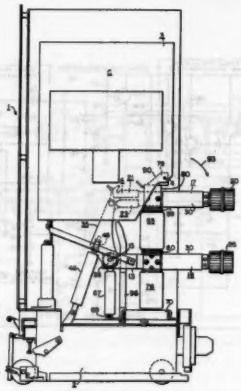


1. A non-registered interconnection module conductively interconnecting substantially opposed and aligned conductive terminals of a pair of spaced circuit devices which comprises:
a wiring support body formed of a resilient material; and
a sheet of flexible insulation material secured to and extending over opposed outer surfaces of said resilient support body, a plurality of paired conductive contacts formed on said flexible sheet with each contact of a pair of contacts being disposed on opposite outer surfaces of said support body, a like plurality of conductive strips on said flexible sheet with each strip interconnecting a pair of oppositely disposed contacts, said contacts being exposed at an outer surface of said sheet and in engagement with the conductive terminals of said circuit devices, said contacts being small and closely spaced, each terminal of said circuit devices engaging at least two of said contacts.

3,967,163
SUPPORTING MEANS FOR THE POWER CONDUCTORS IN CIRCUIT BREAKERS

Charles M. Cleaveland, Irwin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 308,370, Nov. 21, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,169
Int. Cl.² H02B *1/04*; H01B *17/00*
U.S. Cl. 317—112 **12 Claims**



1. The combination in a circuit-breaker structure of a pair of longitudinally-extending spaced power-conductor assemblies, each of said spaced power-conductor assemblies having a stationary contact means disposed adjacent an end thereof, movable contact means for electrically interconnecting said two stationary contact means, one or more pairs of side-by-side post-insulator supports disposed between said spaced power-conductor assemblies for supporting said power-conductor assemblies apart, said one or more pairs of side-by-side post-insulator supports being generally parallel to one another and extending in the same general direction, said one or more pairs of side-by-side post-insulator supports additionally being closely spaced next to each other and mechanically rigidly interconnected at at least one end thereof for combined strength and rigidity of support.

3,967,164
SERVICE ACCESS CONTROL PANEL HAVING ELECTRICAL COMPONENT ARRAY, INTERLOCK SWITCH AND FUSE BLOCK

Michael A. Valle, Oxford, Miss., assignor to Chambers Corporation, Cleburne, Tex.

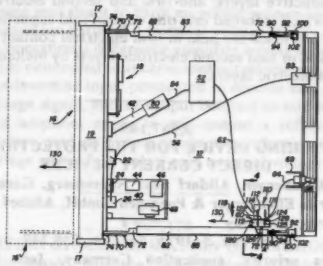
Filed May 10, 1974, Ser. No. 468,897
Int. Cl.² H02B *1/04*; H01H *3/16*; F24C *7/08*
U.S. Cl. 317—114 **8 Claims**

1. A control panel for an oven comprising in combination:
a rectangular panel supported from said oven housing in a position flush with the front of said oven;
controls mounted on and extending through said panel for operating said oven from the front thereof, electrical components wired to said controls and mounted on the rear of said panel;
a pivot plate attached adjacent each side edge of said panel, said plates mounted to extend in a vertical direction;
a slide member pivotally attached to each of said pivot plates;
means on said plate and slide for selectively preventing rotation between said panel and said slides;
channel members mounted on the sides of the oven forming horizontally extending tracks for each of said slides to

allow movement of said panel from a normal position to a service position;

means on said slides and said channel members for limiting horizontal movement of said panel;

conductor means electrically connecting said controls and components on said panel to said oven, said conductor



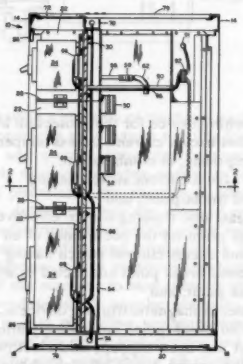
means having sufficient length to permit movement of said panel; and

power control means for disconnecting power to said controls and components when said panel is horizontally moved, said power control means comprising a switch mounted to selectively engage and be operated by the movement of said slide members.

3,967,165
SWITCHBOARD APPARATUS HAVING CONTROL WIRING PASSAGEWAYS

William Francis Olashaw, Plainville, and Roger Thomas Wilbur, Bristol, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Mar. 25, 1975, Ser. No. 561,866
Int. Cl.[2] H02B 1/20
U.S. Cl. 317—120 **8 Claims**



1. Electrical switchboard apparatus comprising, in combination:

A. a cabinet;

B. a cabinet frame

C. a plurality of modular, insulative mounting panels arranged in end-to-end vertical relation throughout the height of said cabinet, each said panel including:

1. a base plate having lateral marginal portions affixed to said frame,

2. a plurality of spaced, parallel ribs outstanding from the rearward side of said base plate to define a plurality of vertically elongated channels, and

3. an additional rib outstanding from each lateral edge portion of said base plate, each said additional rib cooperating with its adjacent channel defining rib to provide a vertical passageway,

4. with said panels in end-to-end vertical relation, said channels and passageways extending substantially the full height of said cabinet;

D. a vertical array of compartments in said cabinet located forwardly of said panels, each said compartment accommodating an electrical device;

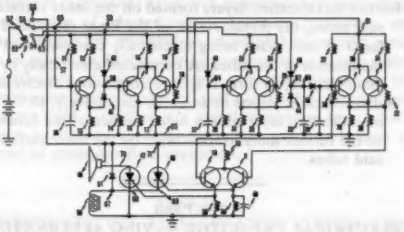
E. an elongated vertical busbar located in each said channel and mounted to said panels; and

F. control wiring for the electrical devices running from said compartments through apertures in said base plate into said passageways.

3,967,166
ELECTRONIC LOCK

Ching-Yeu Wei, 502 Dryden Road, Ithaca, N.Y. 14850

Filed Apr. 25, 1973, Ser. No. 354,248
Int. Cl.[2] H01H 47/18
U.S. Cl. 317—141 S **9 Claims**



1. An antitheft device comprising, in combination:

a switching device including at least two switching actions; and

a timing device which is activated only when a first and a second predetermined one of said switching actions are conducted in sequence and said second predetermined switching action is conducted neither earlier than a first predetermined time nor later than a second predetermined time after the moment when said first predetermined switching action is conducted including:

a. a first circuit connected to said switching device for sensing said first predetermined switching action will be activated when said first predetermined switching action is conducted and will be later de-activated unless said second predetermined switching action is followed not later than said second predetermined time after said first predetermined switching action is conducted;

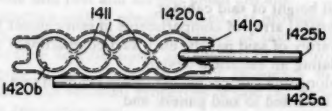
b. a second circuit connected to said switching device for sensing said second predetermined switching action will not be activated unless said second predetermined switching action is conducted not earlier than said first predetermined time after said first predetermined switching action is conducted;

c. a gating circuit connected to said first and second circuits will be activated only when both said first and second circuits are activated, and whereby said timing device is activated when said gating circuit is activated.

3,967,167
MULTIPLE MINIATURE CAPACITOR

Werner Scharrer, Reichenschwand, and Fritz Beyer, Lauf, both of Germany, assignors to Stettner & Co., Lauf, Pegnitz, Germany

Filed Mar. 14, 1974, Ser. No. 451,169
Claims priority, application Germany, Mar. 22, 1973, 2314208
Int. Cl.[2] H01G 4/12, 4/38
U.S. Cl. 317—242 11 Claims



1. Monolithic, single structure integral miniature capacitor structure comprising

a ceramic extruded multi-tubular structural body formed of at least three adjacently located elongated ceramic thin-walled tubes each having a diameter in the order of 1-1/2 to 4 mm. and being of essentially circular cross section, extending parallel, and located next to each other and having common contiguous tangential side wall portions to form an essentially aligned, integrally connected multi-tubular structure;

a first metallization layer located on the outer surfaces of said connected tubes to form a first continuous electrode;

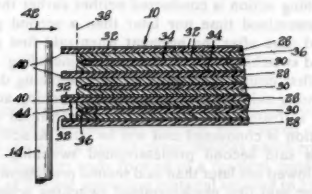
further metallization layers formed on the inner surfaces of said tubes, the metallization of the inner metallized surfaces of said tubes being electrically continuous so that the interior of the tubes are connected electrically by said metallization, to form a second continuous electrode;

and connection means connected, respectively, to the first metallization layer on the outer surface of the tubes and to the further metallization layer on the inner surfaces of said tubes.

3,967,168
ELECTRICAL CAPACITOR HAVING ALTERNATING METALLIZED NONHEAT-SHRINKABLE DIELECTRIC LAYERS AND HEAT-SHRINKABLE DIELECTRIC LAYERS

Kenneth Christensen, Alexandria, Va., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed June 26, 1975, Ser. No. 590,641
Int. Cl.[2] H01G 1/13, 4/20
U.S. Cl. 317—258 2 Claims

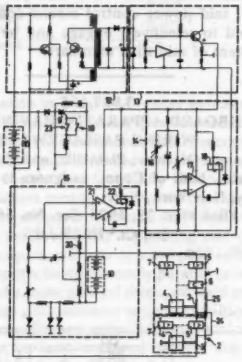


1. A convolutely wound capacitor having a first and a second edge comprising a first dielectric layer with a first conductive electrode layer thereon which extends outwardly from said first edge from said wound capacitor, a second dielectric layer which has a second metallized electrode layer thereon which extends outwardly from said second opposite edge of said capacitor, said first and second dielectric layers being comprised of a nonheat-shrinkable dielectric material, a third dielectric layer of a heat-shrinkable material disposed between said first and second dielectric layers, a fourth layer of heat-shrinkable dielectric material substantially aligned with said third heat-shrinkable layer material and positioned so that said second dielectric layer is positioned intermediate said third or fourth dielectric layers, said third and fourth dielectric layers being heat-treated so that they seal off one end of said second conductive layers from the same end of said first conductive layers and so that they also seal off the opposite end of said first conductive layers from the same end of said second conductive layers, and first and second electrical leads each of which is forced into one edge of said capacitor so that each of said leads are held in firm electrical contact with one of said first or said second electrode layers by melted portions of said dielectric layers.

3,967,169
SWITCHING DEVICE FOR THE PROTECTION OF DIRECT CURRENT DEVICES

Jakob Ellenberger, Altdorf near Nuremberg, Germany, assignor to Ellenberger & Poensgen GmbH, Altdorf near Nuremberg, Germany

Filed Jan. 3, 1975, Ser. No. 538,247
Claims priority, application Germany, Jan. 5, 1974, 2400396
Int. Cl.[2] H02H 7/18
U.S. Cl. 317—33 SC 12 Claims



5. A switching device for the protection of a direct current circuit against excess current, excess temperature and undervoltage comprising, in combination:

a. a first excess current switch having
  i. a first break point, and
  ii. at least one tripping device effective to trip said first break point on the occurrence of an excess current,

b. a second excess current switch having
  i. a second break point connected in series with said first break point, and
  ii. an electromagnetic tripping device effective to trip said second break point immediately after said first break point has been tripped, said electromagnetic tripping device having a coil of high ohmic design, said coil being connected in parallel with said first break point for reducing the excess current after said first break point has been tripped,

c. i. an electrical resistance thermometer for measuring such excess temperature,
  ii. a bridge circuit having said thermometer connected in one leg thereof,
  iii. a thyristor connected to said bridge circuit to become conductive when such excess temperature is reached,

iv. actuating means connected between said break points and said thyristor for tripping said break points when said thyristor becomes conductive,

d. i. a shunt connected in series in the direct current circuit and having means to tap the voltage across said shunt,

ii. means for deriving a proportional part of a working voltage across the direct current circuit,

iii. summing means connected for summing the proportional part of the working voltage and the voltage across said shunt to form an actual voltage signal,

iv. means for deriving a nominal voltage signal, and

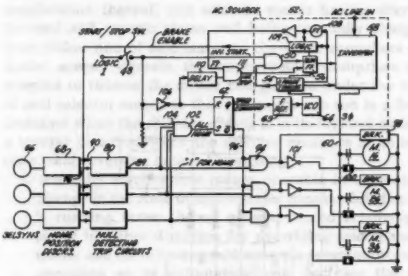
v. an operational difference amplifier having an inverting input connected to receive said actual voltage signal, a non-inverting input connected to receive said nominal voltage signal, and an output coupled to said thyristor, said amplifier apply to said output a voltage which renders said thyristor conductive when said actual voltage signal falls below said nominal voltage signal.

3,967,170

POSITION SYNCHRONIZATION OF MACHINES

Ian M. MacDonald, Kenosha, and Charles J. Cowie, Racine, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 25, 1974, Ser. No. 517,876
Int. Cl.² H02P 7/74
U.S. Cl. 318—85 **16 Claims**



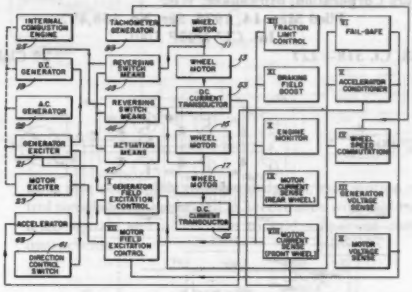
1. In a system having a plurality of machines each including a synchronous motor with an armature winding for producing a magnetic field and a rotor non-slippably coupled with a respective movable machine member, apparatus for synchronizing the relative positions of the plurality of machines comprising means for detecting when the rotor of each of said motors is in a predetermined angular position relative to its respective armature winding and producing a first signal thereupon and stopping means responsive to occurrence of said first signal of the machine to stop rotation of said rotor proximate said predetermined angular position, said rotor position relative to said respective armature winding being substantially the same for all of said motors, and means for subsequently starting and accelerating all of said machines simultaneously from their predetermined angular positions while maintaining position synchronization of said machines, said starting and accelerating means including means for energizing the armature windings of all of said motors simultaneously all with the same phase of A.C. voltage to maintain an instantaneous angular position of armature magnetic field with respect to said predetermined angular position of the respective rotor that is substantially the same for all of said motors.

3,967,171

PROPULSION CONTROL SYSTEM FOR ELECTRICALLY POWERED VEHICLES

Aaron D. Friend, and Hilmer C. Lindahl, both of Longview, Tex., assignors to R. G. LeTourneau, Inc., Longview, Tex.

Division of Ser. No. 344,080, March 23, 1973. This application May 1, 1974, Ser. No. 465,747
Int. Cl.² H02P 5/20
U.S. Cl. 318—158 **5 Claims**



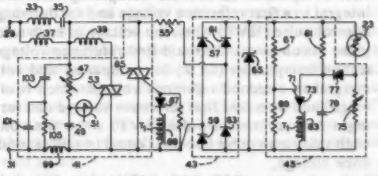
4. In a propulsion control system for an electrically powered vehicle wherein a direct current drive motor having a shunt field is supplied power from a direct current generator having a shunt field and means are provided to accomplish automatic variations in motor field excitation responsive to signals which are a function of selected vehicle operating conditions, and wherein means are provided to accomplish automatic variations in generator field excitation responsive to signals which are a function of selected vehicle operating conditions, the improvement wherein one of said signals for varying said generator field excitation is a signal responsive to a vehicle traction or driving condition requiring quick reduction or reversal of generator field excitation.

3,967,172

CONTROL CIRCUIT, REFRIGERATION SYSTEM, AND METHOD OF CONTROLLING SPEED OF AN ALTERNATING CURRENT MOTOR

Dann W. Denny, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Feb. 10, 1975, Ser. No. 548,765
Int. Cl.² H02P 5/40
U.S. Cl. 318—227 **14 Claims**



1. A control circuit for controlling the speed of an alternating current motor having a plurality of windings adapted to be energized in different combinations comprising:

a first gate controlled full wave alternating current switch coupled in series relations with a pair of the windings and adapted when conductive to effect energization of the motor in one operating speed mode thereof; and

a second gate controlled full wave alternating current switch coupled in parallel relation with said first switch and one winding of the winding pair and in series relation with the other winding of the winding pair, said second

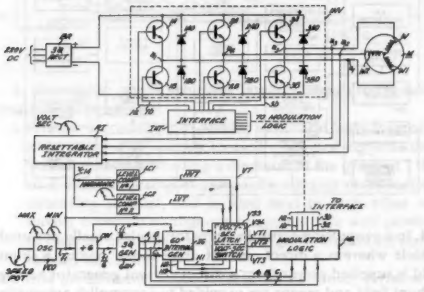
switch being conductive upon the occurrence of preselected conditions for shorting said first switch and the one winding of the winding pair thereby to effect energization of the motor in another operating speed mode thereof.

3,967,173

TRANSISTOR BRIDGE INVERTER MOTOR DRIVE HAVING REDUCED HARMONICS

Frederick A. Stich, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Mar. 14, 1975, Ser. No. 558,497
Int. Cl.[2] H02P 5/40
U.S. Cl. 318—227 **29 Claims**



1. A harmonic-reduced variable frequency and variable voltage power supply for a three phase a.c. motor (M) comprising, in combination,

a d.c. source (BR),

a three phase inverter bridge (INV) including a plurality of power transistors (1A, 1B, 1C, 2A, 2B, 2C) between said d.c. source and said motor,

means (SPEED POT) for deriving an analog speed signal indicative of desired speed of said motor,

oscillator means (VCO) for providing a train of clock pulses (f1) whose frequency is a function of the magnitude of said analog speed signal,

resettable volt/hertz integrator means (RI) receiving as an input the output voltage from said inverter bridge for integrating said output voltage with respect to time and for deriving a train of ramp pulses (v_{c14}) which are synchronized to said clock pulses and whose instantaneous magnitude varies with time as a function of the volt/hertz integral,

a first comparator (LC1) for comparing said volt/hertz integral to a first reference voltage and for deriving a first control pulse (HVT) when the voltage of each said ramp pulse becomes equal to said first reference voltage,

a second comparator (LC2) for comparing said volt/hertz integral to a second reference voltage which is of lower magnitude than said first reference voltage and for deriving a second control pulse (LVT) when the voltage of each said ramp pulse becomes equal to said second reference voltage,

OR-circuit means (D27, D28, Q13) for disabling said integrator means when said first control pulse (HVT) is generated and for holding said integrator means disabled until the succeeding clock pulse (f1) is generated or for disabling said integrator means when the succeeding clock pulse is generated,

a three phase generator (GEN) for deriving three phase reference waves (A, B, C) displaced 120 electrical degrees apart having a 360 electrical degree period equal to the time interval required to generate a predetermined number of said clock pulses with positive and negative half cycles, each of said reference waves being associated with one phase of said bridge,

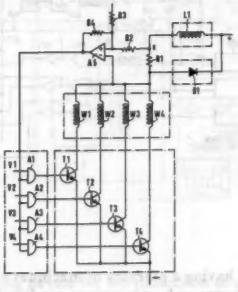
modulation means for controlling the fundamental output voltages of individual phases of said three phase inverter bridge in accordance with said three phase reference waves (A, B, C) and including means for pulse width modulating the output power of said individual phases of said bridge by variable width PWM pulses whose leading edges are established by said clock pulses, said pulse width modulation means regulating the termination of PWM pulses which occur during the first 30 degrees and during the last 30 degrees of the positive half cycles of the associated reference waves as a function of said second control pulses (LVT) and regulating the termination of other PWM pulses in said positive half cycle as a function of said first control pulses (HVT), whereby the magnetic flux in said motor is constant regardless of speed and harmonics are reduced in the inverter bridge output voltages.

3,967,174

ELECTRONIC COMMUTATION APPARATUS FOR A BRUSHLESS D.C. MOTOR

Georg Kögler, Schwabach; Hans Kühnlein, Nurnberg-Grossgrundlach, and Manfred Liska, Nurnberg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 26, 1974, Ser. No. 509,680
Claims priority, application Germany, Oct. 3, 1973, 2349770
Int. Cl.[2] H02K 29/00
U.S. Cl. 318—254 **3 Claims**



1. In combination with a D.C. motor with Y-connected stator windings wherein each stator winding is connected in series with an electronic commutation device, a current control circuit comprising,

a series connected smoothing choke and current measuring resistor wherein said resistor is connected to the commons connection of the windings,

a by-pass diode connected in parallel across said series connected choke and resistor,

a current regulator comprising,

means for generating a signal proportional to the voltage across said current measuring resistor, and

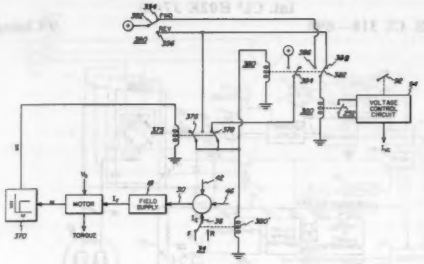
means for cyclically connecting the output of said current regulator to the electronic commutation devices connected to the windings.

3,967,175

AUTOMATIC SEQUENCING SCHEME FOR REVERSING DIRECTIONS OF ELECTRIC TRACTION MOTORS

Barry Jay Turley, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Feb. 27, 1975, Ser. No. 553,863
Int. Cl.² H02P 3/12
U.S. Cl. 318—258 **6 Claims**



1. An improved electric drive system for a self-propelled vehicle comprising a reversible, variable speed traction motor, a speed controller, means for energizing said motor under the control of said speed controller so that the motor runs at variable speeds depending on the setting of said controller, said motor being adapted to be connected to operate in a dynamic retardation mode when said speed controller calls for deceleration thereof, and selector means having alternative forward and reverse states and being manually changeable from either one of said states to the other regardless of the motor speed, wherein the improvement comprises means adapted to reverse the motor energization under the control of said selector means so that the motor can run in a forward direction when the selector means is in its forward state or in a reverse direction when the selector means is in its reverse state, said reversing means comprising:

a. normally inactive first means operable in response to a change in the state of said selector means while the motor is running faster than a predetermined relatively slow speed in either direction for overriding said speed controller and for initiating said dynamic retardation mode of operation so as automatically to decrease the motor speed;

b. second means for reversing motor energization and for inactivating said first means in response to the motor decelerating to said predetermined relatively slow speed as a consequence of operation of said first means; and

c. third means effective after said second means reverses motor energization for preventing another reversal of motor energization by said second means as the motor subsequently accelerates in the opposite direction to a speed higher than said predetermined relatively slow speed in the absence of any further change in the state of said selector means.

3,967,176

PROCESS CONTROL APPARATUS

Paul W. Wagener, Depew, and Francis A. Fluet, Clarence, both of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

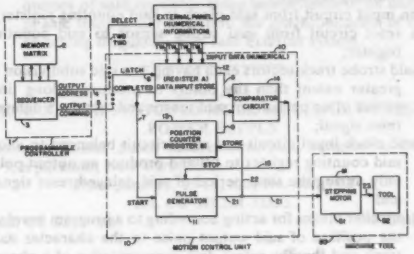
Filed Oct. 15, 1974, Ser. No. 514,873
Int. Cl.² G05B 19/28
U.S. Cl. 318—603 **7 Claims**

1. A machine tool control system comprising: programmable sequence control means for providing programmed sequential operation instructions for motion control;

at least one motion control means responsive to said sequential operation instructions for generating motion control signals to an associated machine tool;

means associated with said one motion control means for providing predetermined numerical control instructions;

translator means associated with said one motion control means for converting said sequential operation instructions into compatible translated signals, said motion control signals being generated in accordance with said translated signals and in relation to said numerical control instructions.

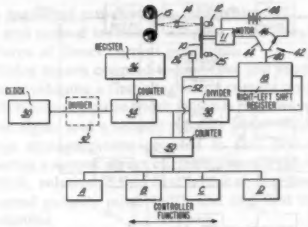


3,967,177

PHOTOCOMPOSITION MACHINE

Frank L. Scholten, Katonah, N.Y., and Ronald A. Kubinak, Edison, N.J., assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Nov. 14, 1974, Ser. No. 523,630
Int. Cl.² G05B 19/18, 1/02; G03B 17/06
U.S. Cl. 318—603 **4 Claims**



1. A photocomposition machine having a variable speed character matrix for coordinating exposure time of a character to print size requirements, comprising:

a master clock of regular pulse frequency;

a strobe track on said matrix divided into a series of sectors, one for each character on said matrix and, each sector subdivided into a series of alternate sensable areas;

a sensor means for detecting said areas and producing a series of pulses representing the type and extent of each sensable area, the rapidity representing motor speed and the duration of each pulse representing the unit space of said areas;

a left shift--right shift register;

an input from said clock connected to drive said shift register to count in a first mode;

an input from said sensor means connected to drive said shift register to count in a second mode opposed to said first mode;

an output from said shift register responsive to the toggled condition within said shift register for producing either a high or low signal;

a power supply responsive to said output of the shift register for applying power to said motor only when said output is at one of said two possible levels, whereby the motor speed is controlled by power pulses;

at least one data track on said matrix divided into a series of sectors, one for each character on said matrix, each sector having a pattern of sensable areas representing digital information pertaining to the character;

a counting register;

an input circuit from said clock to said counting register;

a reset circuit from said strobe sensor to said counting register;

said strobe track sectors each having one said subdivision of greater extent than the others to produce a long time period of no pulse from said sensor and thereby a delayed reset signal;

said clock input circuit and reset circuit balanced to allow said counting register to fill and produce an output pulse only during the time period of said delayed reset signal; and

controller means for acting according to a program to relate the position of said output pulse to the character data track and thereby select data representative of a chosen character for performing photocomposition functions responsive to said output signal.

3,967,178

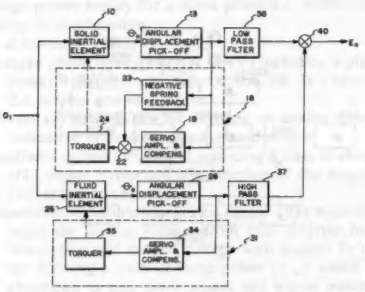
WIDE BAND ANGULAR DISPLACEMENT AND VELOCITY SENSOR AND METHOD

Harold D. Morris, Orinda, Calif., assignor to Systron Donner Corporation, Concord, Calif.

Continuation-in-part of Ser. No. 352,889, April 20, 1973, abandoned. This application July 15, 1974, Ser. No. 488,784

Int. Cl.² G01P *15/00;* **B64C** *17/02*

U.S. Cl. 318—648 **30 Claims**



1. In a transducer for detecting angular displacement about a sensitive axis having a support base and an external reference indicating orientation of the sensitive axis, a solid inertial element movable relative to said support base about the sensitive axis, means for supporting said solid inertial element on said base allowing motion about the sensitive axis, a first pickoff disposed between said solid inertial element and said base for providing a first output signal, first pickoff centering feedback means receiving said first output signal for urging said solid inertial element toward a substantially neutral position relative to said base, a fluid inertial element movable relative to said base about the sensitive axis, a second pickoff having a moving member in communication with said fluid inertial element and a stationary member mounted on said support base for providing a second output signal, second pickoff centering feedback means receiving said second output signal for urging said moving member toward a substantially neutral position relative to said base, a low pass filter for receiving said first output signal and producing output related to low frequency angular displacements, a high pass filter for receiving said second output signal and producing output related to high frequency angular displacements, and summing means for combining the outputs of said low and high pass filters and producing output related to angular displacement through the low and the high frequency spectrum.

3,967,179

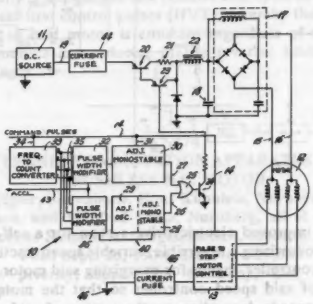
POWER SUPPLY FOR A STEPPING MOTOR

Robert J. Loyzim, Coventry, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed May 30, 1974, Ser. No. 474,671

Int. Cl.² H02K *37/00*

U.S. Cl. 318—696 **9 Claims**



1. A power supply for use with a stepping motor that produces an incremental movement for each change of energization applied thereto and a motor control circuit connected to receive input command pulses and change the energization of the motor for each pulse received with energy from the power supply, said power supply including input means connectible to a source of direct current, output means connected to supply the energy to the motor under the control of the motor control means and means for varying the ratio of the duration of the state of conduction to the duration of the state of non-conduction between the input means and the output terminals in accordance with the rate of the command pulses to thereby control the power transmitted to the motor and in which a duration of a state of conduction alternates with a duration of a state of non-conduction with there normally being at least one duration of each state for each input command pulse and in which the varying means includes a running circuit that includes means for receiving command pulses to sense the rate thereof and for increasing the duration of the state of conduction as the rate of the command pulses increases.

3,967,180

POWER SUPPLY SYSTEM FOR EXTRACTION MACHINE, ESPECIALLY A DRUM-CUTTING MACHINE

Karl-Heinz Weber, Witten-Heven, and Hans Nohendorf, Dorsten, both of Germany, assignors to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany

Filed Dec. 9, 1974, Ser. No. 530,820

Claims priority, application Germany, Dec. 11, 1973, 2362107

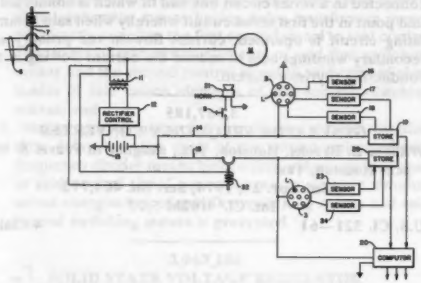
Int. Cl.³ H02J *7/00;* **H02H** *1/02*

U.S. Cl. 320—13 **6 Claims**

1. In a mining machine including a drum-cutting mining machine of the type in which at least one drive motor is supplied with high voltage current via an external power cable essentially only during times of required powered movement by the machine and wherein the mining machine includes an intrinsically-safe enclosure containing at least a chargeable battery which is coupled to charging means powered by the intermittent supply of high voltage current to the mining machine, said chargeable battery supplying low voltage current for two separate groups of control, monitoring and/or indicating devices with one group consisting of devices per-

forming non-essential functions to the mining machine when it is non-functional, the improvement which comprises:

first means for passing the low voltage current from said chargeable battery to said one group of devices which is operatively essential only when the mining machine is functional as defined by the time when the machine is supplied with high voltage current,



second means independent of said first means for continuously powering the second and separate group of said devices with low voltage current from said chargeable battery for continuous operation of such devices which is essential to the mining machine and independent of the operative status thereof, and

means responsive to the absence of a supply of high voltage current to the mining machine for disabling the operation of said first means.

3,967,181

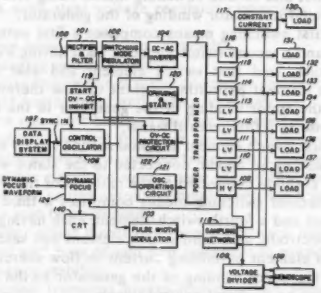
CONVERTER WHEREIN SWITCHING FREQUENCY IS INDEPENDENT OF OUTPUT VOLTAGE AND IS SYNCHRONIZED TO AN EXTERNAL SYSTEM

Derek Chambers, Framingham, Mass., and A. Leonard Harley, Norwalk, Conn., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 34,932, May 6, 1970, Pat. No. 3,818,128. This application Jan. 24, 1974, Ser. No. 436,307

Int. Cl.² H02M 5/456

U.S. Cl. 321—2 **2 Claims**



1. In combination:

rectifier means for receiving line voltage;

switching regulator means for converting said line voltage into a chopped dc voltage;

first control means for synchronizing the output of said switching regulator with an external system;

a power transformer for conversion of said controlled output of said switching regulator into a plurality of high voltage and low voltage outputs; and

second control means including a pulse width modulator for sensing the outputs of said power transformer and modifying the pulse width of said switching regulator in accordance with with said sensed output, the switching frequency of said regulator being independent of an output of said transformer to permit the synchronization of said switching frequency with said external system.

3,967,182

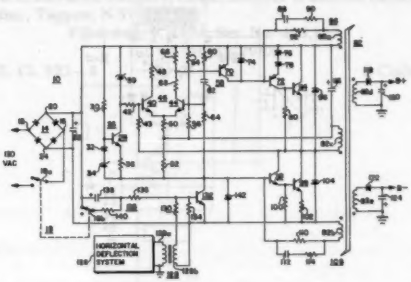
REGULATED SWITCHED MODE MULTIPLE OUTPUT POWER SUPPLY

Howard Mulder Scott, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 20, 1975, Ser. No. 588,912

Int. Cl.² H02M 3/335

U.S. Cl. 321—18 **9 Claims**



1. A regulated power supply comprising:

first and second terminals adapted to be coupled to a first source of direct current potential;

oscillator means coupled to said first and second terminals for developing a first alternating current potential having a first polarity pulse width which is responsive to a correction signal and a second polarity pulse width;

charge storage means coupled to said first terminal for storing a second direct current potential the magnitude of which, relative to said first terminal, is a function of said second polarity pulse width and said first direct current potential;

potential reference means coupled to said first and second terminals for developing a third direct current potential which is of a fixed magnitude and polarity with respect to said first terminal; and

potential comparator means coupled to said potential reference means and said charge storage means for developing a correction signal when said second direct current potential is different from third direct current potential, thereby altering said first polarity pulse width.

3,967,183

SELF-COMMUTATING INVERTER WITH CONTROLLED MAIN VALVES IN A CENTER-TAP CIRCUIT

Harald Heinicke, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 29, 1974, Ser. No. 528,487

Claims priority, application Germany, Dec. 4, 1973, 2360426

Int. Cl.² H02M 7/515

U.S. Cl. 321—45 C **2 Claims**

1. In a self commutating inverter circuit comprising,

an output transformer, the primary windings of which have a center tap connected to the positive terminal of a source of d-c voltage, the output windings of which are connected to a variable load,

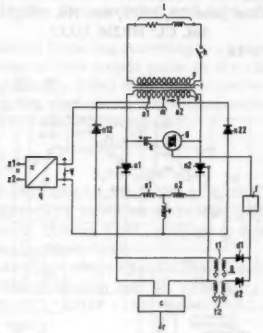
two main valves, the anode of each one connected respectively to the ends of said primary winding, the cathode of

each connected to the negative terminal of said source of d-c voltage through a series choke inductor,

two recovery diodes, the cathode of each one connected respectively to taps on either side of said center tap between said center tap and said ends of said primary winding, the anode of each one connected to said negative terminal of said source of d-c voltage,

a series connected commutation capacitor and bidirectional electronic switching member, having a control electrode connected between the anodes of said main valves, and

means for generating firing impulses for said main valves, the improvement comprising:



first and second potential separating transformers each having a primary winding and a secondary winding, the primaries of said first and second transformers coupled respectively to the outputs of said means generating firing impulses for said two main valves;

differentiating means having its output coupled to said control electrode of said bidirectional electronic switching means,

an OR gate made up of two blocking diode having its two inputs coupled respectively to the secondaries of said first and second transformers and its output coupled as an input to said differentiating means.

3,967,184

ELECTRICAL INVERTER CIRCUIT

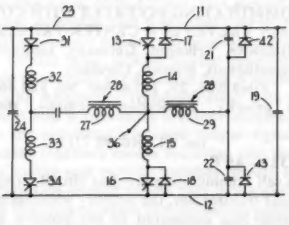
Brian John Chalmers, Bramhall, and John Philip Gibson, Longsight, both of England, assignors to C.A.V. Limited, Birmingham, England

Filed Dec. 24, 1974, Ser. No. 536,157

Claims priority, application United Kingdom, Dec. 22, 1973, 3370/73

Int. Cl.² H02M 7/515

U.S. Cl. 321—45 C **5 Claims**



1. An electrical inverter comprising in combination positive and negative supply lines, a first series circuit bridging the positive and negative supply lines and including the anode-cathode path of a first thyristor and the anode-cathode path of a second thyristor, a second series circuit bridging the first and second supply lines and including a pair of capacitors, and a commutating circuit for the first and second thyristors, said commutating circuit including a transformer having its secondary winding included in a connection between a point in the first series circuit intermediate the first and second thyristors, and a point in the second series circuit intermediate the pair of capacitors, the primary winding of the transformer being connected in a series circuit one end of which is connected to said point in the first series circuit whereby when said commutating circuit is operated, current flow in the primary and secondary windings acts to reduce the current flowing in the conducting thyristor to zero.

3,967,185

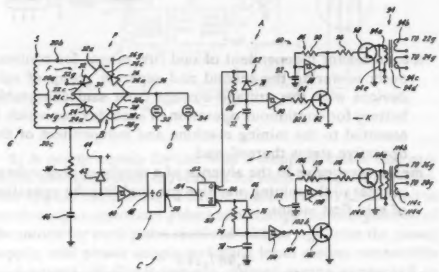
GENERATOR FREQUENCY CONVERTER

William E. Brooks, Houston, Tex., assignor to Pravel & Wilson, Houston, Tex.

Filed Apr. 29, 1974, Ser. No. 464,772

Int. Cl.² H02M 5/27

U.S. Cl. 321—61 **4 Claims**



1. An apparatus for converting the output frequency of electrical power from an electrical generator, comprising:

a. power switching means for switching the power output of the generator to a load, said power switching means comprising:

1. first switching means for switching output pulses of a first electrical polarity to the load;

2. second switching means for switching output pulses of a second electrical polarity to the load;

3. said first and second switching means being electrically connected to a stator winding of the generator;

4. said first switching means comprises a first switch element and a second switch element, each having a control electrode, said first switch element and said second switch element permitting current to flow therethrough from the stator winding of the generator to the load in response to a first control signal;

5. said first switch element and said second switch element each having an anode, connected to the stator winding, and a cathode connected to the cathode of the other;

6. said second switching means comprises a third switch element and a fourth switch element, each having a control electrode, said third switch element and said fourth switch element permitting current to flow therethrough from the stator winding of the generator to the load in response to a second control signal;

7. said third switch element and said fourth switch element each having an anode, the cathode of the third switch element being directly connected to the anode of the first element and the stator winding, the cathode of the fourth switch element being directly connected to the anode of the second switch element and the stator winding; and

8. said third switch element and said fourth switch element each further having an anode connected to the anode of the other, wherein said switch elements form a voltage responsive switching bridge directly connected to the stator winding; and

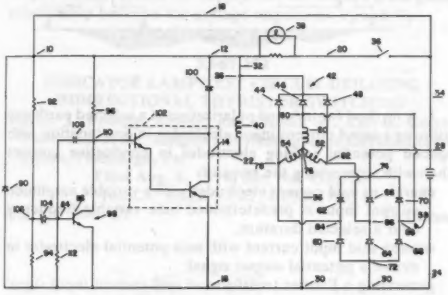
b. control means for controlling the operating frequency of said power switching means, said control means comprising:

1. frequency divider means forming output pulses at a fraction of the output frequency of the generator;
2. control signal generator means for alternately energizing said first switching means and said second switching means to provide power to the load in response to output pulses from said frequency divider means, said control signal generator means having pulse transformer means for directly coupling the first control signal to said control electrodes of said switch elements of said first switching means and the second control signal to said control electrodes of said switch elements of said second switching means; and
3. timing control means for introducing a fixed duration time delay between each of the output pulses of said frequency divider means before such pulses are furnished to said control signal generator means wherein simultaneous energization of said first switching means and said second switching means is prevented.

3,967,186
SOLID STATE VOLTAGE REGULATOR

Guy Adams, Monroe, N.Y., assignor to Solitron Devices, Inc., Tappan, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,550
Int. Cl.² H02J 7/14
U.S. Cl. 322—28 **1 Claim**



1. A solid state voltage regulator comprising in combination:

source input and output terminals;

a charging means terminal;

a measuring circuit of series connected resistances between said source input and output terminals;

a first transistor between said source input and output terminals, said first transistor having a base emitter diode point providing a positive temperature coefficient;

a resistor circuit between a base of said first transistor and the said source output terminal to provide source stability for said first transistor;

a Miller effect circuit between said source input terminal and said base of said first transistor to provide high frequency stability;

a second transistor means including two transistors in a Darlington circuit in a single chip of semiconductor material to avoid mismatching of base emitter diode operating points of discrete transistors while providing consistancy with said first transistor, said second transistor means being between said source input and output terminals and being operatively connected to said first transistor, said second transistor means having its common collector output connected to said charging means terminal;

a diode means between said charging means terminal and said input terminal to provide a return path for decay in field from said charging means terminal;

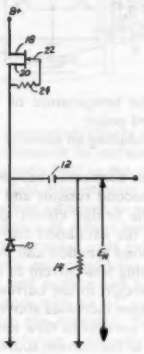
a voltage reference zener diode connected between said first transistor and said measuring circuit between said series connected resistances, said zener diode having a base emitter diode point such as to provide a negative temperature coefficient to in combination with said first transistor positive temperature coefficient and the consistant base emitter diode operating point of said second transistor means provide a means to predetermine temperature compensation and provide the required voltage per °C for any known temperature excursion; and

a diode connected between said source output terminal and said source input terminal to provide reverse transient protection for said voltage regulator.

3,967,187
CURRENT LIMITING OF NOISE DIODES

Lon E. Edwards, Danbury, Conn., assignor to Solitron Devices, Inc., Tappan, N.Y.

Filed Aug. 9, 1974, Ser. No. 496,140
Int. Cl.² H03B 29/00
U.S. Cl. 323—4 **2 Claims**



1. A random noise generator comprising:

a semiconductor noise generating element;

a time delay circuit for delivery of the output of said element at a desired frequency, impedance match; and

a FET connected to a power source via its drain terminal and to said element via its source terminal for controlling current to said element, said FET having a single resistor tapped between said source terminal and a gate terminal thereof to control variations in drain current over a temperature range.

3,967,188
TEMPERATURE COMPENSATION CIRCUIT FOR SENSOR OF PHYSICAL VARIABLES SUCH AS TEMPERATURE AND PRESSURE

William H. Spencer, Monrovia, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 363,381, May 24, 1973, which is a continuation of Ser. No. 152,199, June 11, 1971. This application Aug. 14, 1975, Ser. No. 604,620
Int. Cl.² G01L 9/02, 19/04
U.S. Cl. 323—75 B **27 Claims**

1. In combination:

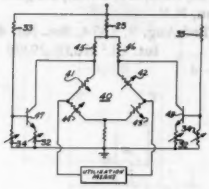
four pressure sensitive strain gages and two resistors connected in a Wheatstone bridge configuration having first and second input nodes and first and second output nodes, the bridge having an overall positive temperature coefficient so that the output voltage of the bridge when in use will increase wit an increase in the gage temperature;

a first resistor connected in series with one of the gages between the first input node and the first output node;

a second resistor connected in series with another of the gages between the first input node and the second output node.

the first and second resistors being connected in common to the first input node;

first circuit means connected between a first junction common to the first resistor and its associated gage in one leg of the bridge and the second input node for varying the excitation current to the gage connected to the first junction and the gage connected to that gage by causing less current to flow through the two gages when connected to a current source as the temperature of the gages increases above a selected point and by causing more current to flow through the two gages when connected to the current source as the temperature of the gages decreases below the selected point;



the circuit means including an element in thermal proximity to the gages;

second circuit means connected between a second junction common to the second resistor and its associate gage in another leg of the bridge circuit and the second input node for varying the excitation current to the gage connected to the second junction and the gage connected to that gage by causing less current to flow through the two gages when connected to the current source as the temperature of the gages increases above a selected point and by causing more current to flow between the two gages when connected to the current source as the temperature of the gages decreases below the selected point; and

the second circuit means including an element in thermal proximity to the gages.

3,967,189

POWER SUPPLY FOR ELECTRONIC CIRCUITS AT HIGH-VOLTAGE POTENTIAL

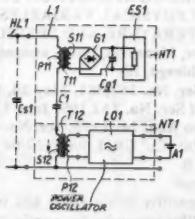
Eckart Maenicke, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 15, 1972, Ser. No. 289,622

Claims priority, application Germany, Sept. 16, 1971, 2146772

Int. Cl.[2] H02J *13/00*

U.S. Cl. 323—76 **14 Claims**



1. Power supply apparatus for supplying power from a low-voltage reference potential to an electronic circuit operable with respect to a high-voltage potential such as an electronic circuit for detecting the current in a high-voltage conductor and the like, the electronic circuit being connected to an associated transformer for receiving electric energy, the apparatus comprising a power oscillator operable with respect to the low-voltage potential and having an output transformer, current path means for conducting electric power from said output transformer of said oscillator at low-voltage potential to the associated transformer connected to the electronic circuit, and power source means for supplying electric power to said power oscillator independently of the value of the electrical energy at the high-voltage potential.

3,967,190

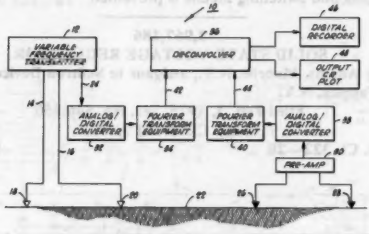
METHOD USING INDUCED POLARIZATION FOR ORE DISCRIMINATION IN DISSEMINATED EARTH DEPOSITS

Kenneth L. Zonge, 5634 E. Pima, Tucson, Ariz.

Filed Dec. 23, 1974, Ser. No. 535,999

Int. Cl.[2] G01V *3/06*

U.S. Cl. 324—1 **8 Claims**



1. A method for induced polarization at a selected earth site utilizing spaced current input electrodes in combination with spaced potential sensing electrodes in conductive contact therewith, comprising the steps of:

energizing said current electrodes with a variable amplitude current input at predetermined time variable frequency over a selected duration;

sensing said input current with said potential electrodes to derive a potential output signal;

generating a Fourier transform of said current input signal over said duration;

generating a Fourier transform of said sensed potential output signal over said duration;

deconvolving the Fourier transform of said current input signal with the Fourier transform of said sensed potential signal to generate a deconvolution output over said duration, which deconvolution output indicates the complex resistivity in terms of potential magnitude and phase difference; and

constructing an output plot of said deconvolution output signal to determine magnitude and phase at selected frequencies over said selected duration to generate a complex resistivity curve.

3,967,191

METHOD AND APPARATUS FOR NON-DESTRUCTIVELY MEASURING INTERNAL FILM RESISTANCE IN A FLUORESCENT LAMP

William J. Roche, Merrimac, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Feb. 28, 1975, Ser. No. 554,035

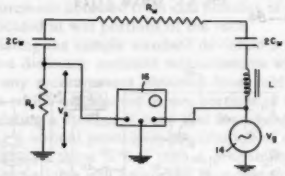
Int. Cl.[2] G01R *31/24*

U.S. Cl. 324—20 R **29 Claims**

1. A method for non-destructively measuring the resistance, R_w, of a conductive film coating on the interior bulb wall of a fluorescent lamp, said method comprising:

disposing first and second spaced apart capacitive coupling means on the exterior bulb wall of said fluorescent lamp, said first capacitive coupling means being connected

through a sensing resistance means to a source of reference potential, and said second capacitive coupling means being connected through circuit means to a first output terminal of a variable frequency AC voltage supply, a second terminal of said AC voltage supply being connected to said source of reference potential, said AC supply being at a selected fixed frequency, and the circuit including said first and second capacitive coupling means and said circuit means being in resonance at the selected frequency of said AC voltage supply;



and measuring at least the voltage, V_s, across said sensing resistance means, said internal film resistance R_w being determinable from the equation

$$R_w = R_s (V_g \cos \theta - V_s)/V_s$$

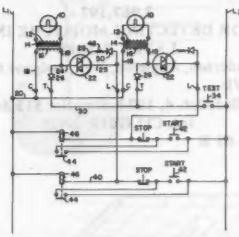
where R_s is the value of said sensing resistance, V_g is the output voltage of said AC supply, and the angle θ is the phase relationship between the voltage waveforms V_g and V_s.

3,967,192

INDICATOR LAMP TEST CIRCUIT UTILIZING BIDIRECTIONAL THYRISTOR SWITCHING

Walter J. Kellogg, Beaver, and Chester W. Calvin, Beaver Falls, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1974, Ser. No. 495,756
Int. Cl.² G01R *31/22*; H05B *37/03*
U.S. Cl. 324—21 **11 Claims**



1. An indicator light circuit operable from an alternating current supply for indicating the operation of a plurality of external devices, comprising:

a plurality of indicator lights;

test circuit means connected to all of said plurality of indicator lights for simultaneously energizing all of said plurality of indicator lights when said test circuit means is activated, thereby simultaneously testing the operability of all of said plurality of indicator lights;

a plurality of indicator circuit means, each connected to an associated indicator light and coupled to an associated external device, for permitting energization of the associated indicator light when activated in response to operation of the associated external device; and

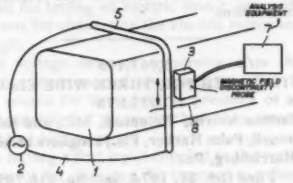
a bidirectional switchable device disposed between each of said plurality of indicator circuit means and the associated indicator light, said bidirectional switchable device permitting bidirectional current flow through said indicator circuit means when activated in response to operation of an external device and isolating said indicator circuit means from said indicator light when deactivated in response to operation of an external device.

3,967,193

APPARATUS FOR ELECTROINDUCTIVELY DETECTING DISCONTINUITIES BELOW THE SURFACE OF A METAL OBJECT

Carl Gunnar Bergstrand, Skultuna, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed July 14, 1972, Ser. No. 272,020
Claims priority, application Sweden, July 15, 1971, 9188/71
Int. Cl.² G01R *33/12*
U.S. Cl. 324—37 **4 Claims**



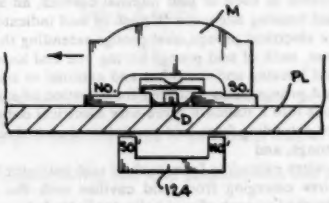
1. Apparatus for electroinductively detecting discontinuities in a metal object beneath its surface and including means for generating a magnetic field in the object through its surface and a magnetic field discontinuity probe that is movable over the object's surface adjacent to said field; wherein the improvement comprises said means being formed by at least one conductor having terminal ends between which the conductor extends directly, said conductor being positioned substantially parallel to said surface and having means for connecting its terminal ends with an AC current source without substantially affecting the magnetic field generated in the object only by said conductor, said conductor forming a guide rail for the probe during its movement along the object.

3,967,194

METHOD FOR FLAW LOCATION IN A MAGNETIZABLE PIPELINE BY USE OF MAGNETIC MARKERS POSITIONED OUTSIDE OF SAID PIPELINE

Ruby C. Beaver, Houston, Tex.; Theodor Clasen, Wienhausen; Wolfgang Henning, Celle, both of Germany, and Emil S. Johnson, Houston, Tex., assignors to Vetco Offshore Industries, Ventura, Calif.

Division of Ser. No. 451,505, March 15, 1974, Pat. No. 3,899,734, which is a continuation-in-part of Ser. No. 360,161, May 14, 1973, abandoned. This application Jan. 8, 1975, Ser. No. 539,398
Int. Cl.² G01R *33/12*
U.S. Cl. 324—37 **8 Claims**



1. A method of determining the location of flaws in a magnetizable pipeline, said method including the steps of:

causing a magnetizing means to traverse the interior of the pipeline in sufficiently close proximity to the pipeline to induce magnetic flux flow in the pipeline and in the interior of the pipeline;

placing a magnetic marker at a selected location along the pipeline and exterior to the pipeline and oriented in opposed relationship with respect to said magnetizing means, so that said marker causes first an increase, then a decrease, then an increase in said flux flow in the interior of the pipeline as said magnetizing means passes by said marker;

detecting said decrease;

recording said decrease;

detecting variations in said magnetic flux flow in the interior of the pipeline, which variations are caused by flux leakage resulting from flaws in the pipeline;

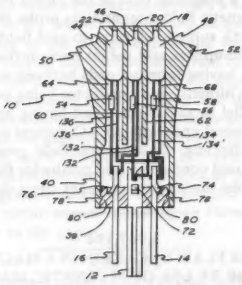
recording said variations; and

correlating said decrease with said variations to determine the positions of detected flaws with respect to said selected location.

3,967,195
CIRCUIT TESTER FOR THREE WIRE ELECTRICAL OUTLETS

Marnie Carlton Averitt, Timonium, Md., and Edward Denman Bunnell, Palm Harbor, Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 21, 1974, Ser. No. 516,709
Int. Cl.² G01R 31/02
U.S. Cl. 324—51 **6 Claims**



6. A circuit tester for checking a standard grounded three-wire electrical outlet to determine if said outlet is properly wired, said circuit tester comprising:

a hollow insulating housing comprising two opposed sidewalls, two opposed endwalls extending therebetween, and a top wall and an opposed base,

at least two inner walls spaced from said base, said inner walls, said sidewalls and said endwalls defining three internal cavities,

three electrical indicator lights, one of said lights being located in each of said internal cavities, an aperture in said housing aligned with each of said indicator lights,

three electrical prongs, said prongs extending through said base, each of said prongs having one end located within said housing and the other end external to said housing, said prongs being oriented for insertion of said external ends into a standard three-wire electrical outlet,

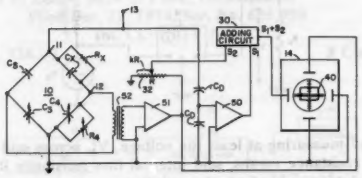
a slot extending from said one internal end of each of said prongs, and

two wires extending from each of said indicator lights, said wires emerging from said cavities with the two wires attached to each of said indicator lights being attached to different prongs, said wires inserted laterally of their axis into said slots to establish electrical contact with said prongs, whereby a properly wired electrical outlet will energize prescribed indicator lights and occurs an improperly wired outlet will result in some other lighting display.

3,967,196
METHOD AND APPARATUS FOR MEASURING THE VOID CONTENT OF A SOLID DIELECTRIC

Allan Igo Bennett, Export, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 17, 1974, Ser. No. 515,745
Int. Cl.² G01R 31/14
U.S. Cl. 324—54 **10 Claims**



10. Apparatus for determining the void content of a solid dielectric sample comprising:

bridge means adapted to receive the solid dielectric sample as the dielectric of a capacitor disposed therein;

input means for supplying an alternating current potential to the bridge means;

measuring means for measuring the output of the bridge means;

first adjusting means for making $dS_2/dt = 0$ just after peaks of S_1;

second adjusting means for making $d(S_1 + S_2)/dt = 0$ just before peaks of S_1; wherein,

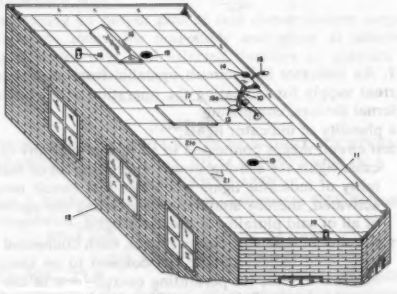
S_1 is a signal proportional to the input to said bridge means; and,

S_2 is a signal proportional to the output of said bridge means.

3,967,197
METHOD FOR DETECTING MOISTURE IN MULTIPLE LAYER ROOFS

Richard G. Anderson, Appleton, Wis., assignor to A-Tech, Inc., Appleton, Wis.

Filed Oct. 4, 1974, Ser. No. 512,362
Int. Cl.² G01R 27/26
U.S. Cl. 324—61 R **6 Claims**



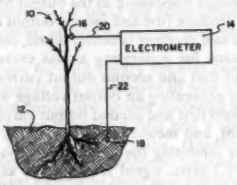
1. A method of detecting the presence and location of moisture in a multiple layer roof with less than a chosen probability P of designating a point at a dry portion of the roof as a point at a wet portion of the roof, comprising the steps of:

a. locating a plurality of spaced points over the area of the roof,
b. measuring the relative dielectric constant of the roof at each of said spaced points,
c. recording the relative dielectric constant measurements obtained at each of said spaced points and associating each measurement with the location of the point at which it was taken,
d. locating a plurality of said spaced points which are at wet portions of the roof,
e. calculating the sample mean M of all of said relative dielectric constant measurements which are less than any measurement obtained from said plurality of points which are located at wet portions of the roof,
f. calculating the sample standard deviation S of all of said relative dielectric constant measurements which are less than any measurement obtained from said plurality of points which are located at wet portions of the roof;
g. calculating a number K such that for a random variable having a normal probability distribution of mean M and variance S^2, there is less than a probability P that the random variable will be greater than or equal to K, and
h. designating as points at wet portions of the roof those points on the roof having relative dielectric constant measurements that are greater than K.

3,967,198
METHOD AND APPARATUS FOR ELECTRICALLY DETERMINING PLANT WATER STATUS

William G. Gensler, 4020 Coronodo Drive, Tucson, Ariz. 85718

Filed Sept. 20, 1974, Ser. No. 507,789
Int. Cl.² G01R *19/00, 27/22, 15/00*
U.S. Cl. 324—72 14 Claims

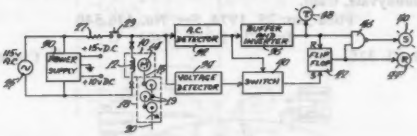


1. A method for measuring the water status of a plant comprising the steps of:
placing a first electrical probe in contact with the root environment of the plant;
placing a second electrical probe in contact with the body of the plant;
measuring the long term variations in electrical potential generated by the plant between the first and second probes, said step of measuring the long term variations in electrical potential including the steps of sensing the electrical potential generated by the plant, filtering out the short term variations of the sensed potential, and recording the long term variations of the sensed potential; and
relating the long term variations in electrical potential to the water status of the plant.

3,967,199
METHOD AND APPARATUS FOR TESTING ELECTRIC MOTORS

Donald E. Knoop, Benton Harbor, and Rodney F. Seeland, St. Joseph, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 18, 1974, Ser. No. 524,494
Int. Cl.² G01R *31/02*
U.S. Cl. 324—158 MG 10 Claims

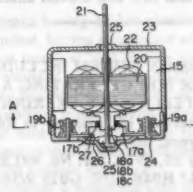


1. A circuit for testing an electric motor, comprising:
switch means for connecting the electric motor to a source of voltage;
a residual voltage detector responsive after the switch means has disconnected the electric motor from the voltage source for detecting the presence of a residual voltage generated if the motor had been rotated and is decelerating to a stop;
a memory having a first input coupled to the residual voltage detector for changing the memory to a first state in response to detection of the residual voltage, the first state existing for a substantially longer time period than the time duration of the residual voltage, the memory further having a reset input responsive to a reset signal for clearing the memory from the first state to a clear state;
an indicator actuated in response to the first state of the memory for indicating that the electric motor was operative; and
reset means coupled to the reset input for generating the reset signal when the switch means connects the voltage source to the electric power.

3,967,200
SPEED DETECTOR FOR USE WITH MINIATURE DC MOTOR

Yoshio Tetsugu, Katano; Tsunemi Mitsui, Osaka, and Hiroshi Minakuchi, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Oct. 15, 1974, Ser. No. 514,841
Claims priority, application Japan, Oct. 26, 1973, 48-120881; May 17, 1974, 49-55875
Int. Cl.² G01P *3/48*; H02K *47/14*
U.S. Cl. 324—173 4 Claims



1. A speed detector for use with a miniature DC motor comprising
a. a field pole assembly made of permanent magnet material,
b. an armature having said field pole assembly and having slots,
c. detecting means for detecting the magnitudes and directions of the leakage fluxes from said field pole assembly, said detecting means being placed at least two positions

in opposed relation with the N- and S-poles of said field pole assembly and remote from the area between the field pole assembly and the armature,

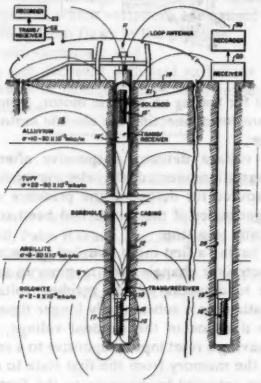
thereby deriving a speed signal from the output terminals of said detecting means.

3,967,201

WIRELESS SUBTERRANEAN SIGNALING METHOD

Louis H. Rorden, Menlo Park, Calif., assignor to Develco, Inc., Sunnyvale, Calif.

Filed Jan. 25, 1974, Ser. No. 436,540
Int. Cl.² H04B 13/02
U.S. Cl. 325—28 28 Claims



1. In a method for establishing a wireless communication link through a subterranean region of earth or water the steps of:

disposing a first magnetic dipole antenna vertically in a subterranean location so as to have the magnetic dipole thereof oriented vertically;

disposing a second magnetic antenna in spaced apart relation from said first magnetic antenna, said first and second antennas being spaced apart by an intervening subterranean region of earth or water;

exciting one of said magnetic antennas with time varying excitation so as to set up at said excited antenna a vertically polarized time varying magnetic field and passing said time varying magnetic field through the intervening subterranean region of earth or water between said first and second magnetic antennas; and

receiving and detecting the time varying magnetic field as passed between said first and second antennas.

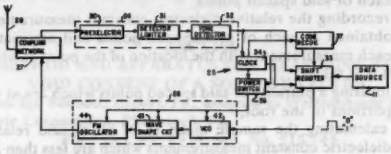
3,967,202

DATA TRANSMISSION SYSTEM INCLUDING AN RF TRANSPONDER FOR GENERATING A BROAD SPECTRUM OF INTELLIGENCE BEARING SIDEBANDS

James E. Batz, Northbrook, Ill., assignor to Northern Illinois Gas Company, Aurora, Ill.

Filed July 25, 1974, Ser. No. 491,829
Int. Cl.² H04B 1/59; G01S 9/56
U.S. Cl. 325—31 22 Claims

17. In a data transmission system, transmitter means at a first location for transmitting information provided by a data source means at said first location to a receiver means at a second location, said transmitter means comprising first oscillator means operable to generate a carrier signal, second oscillator means connected to said data source means and controlled by data signals representing said information provided by said data source means to provide sinusoidal output signals at predetermined frequencies, and wave shaping means responsive to said sinusoidal output signals to provide linearly varying drive signals having unequal rise and fall times for said



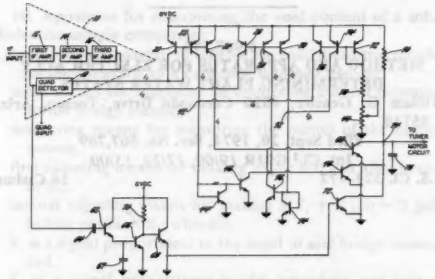
first oscillator means to effect the generation of sets of sidebands of said carrier signal representing said information for transmission to said receiver means.

3,967,203

SIGNAL SEEKING RECEIVER STOPPING CIRCUIT

Larry D. Lucas; Burtron D. Schertz, and Lester Wilkinson, all of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 3, 1975, Ser. No. 554,982
Int. Cl.² H04B 1/32
U.S. Cl. 325—349 2 Claims



1. In an FM receiver having IF amplifier means, and quadrature detector means responsive to the output of said IF amplifier and which produce first and second output currents which are equal when said receiver is center tuned, the improvement comprising means for generating a bias current, means responsive to said first and second output currents and to said bias current for generating an output voltage when the difference between said first and second output currents is less than said bias current, and means responsive to the output of said IF amplifier for inhibiting the generation of said output voltage unless a 10.7 mHz. signal is present in said IF amplifier and capacitance means adapted to be charged from said output voltage.

3,967,204

CIRCUIT FOR STORING THE AMPLITUDE OF THE LOWER-FREQUENCY PORTION OF A COMPOSITE SIGNAL

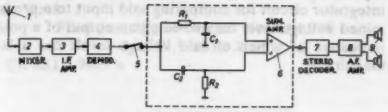
Jens Hansen, Hildesheim, Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Germany

Filed June 23, 1975, Ser. No. 589,184
Claims priority, application Germany, June 10, 1974, 2427878
Int. Cl.² H04B 1/10
U.S. Cl. 325—473 5 Claims

1. Circuit for storing the amplitude value of the lower-frequency portion of a composite electrical signal during intervals in which the provision of the signal from a source supplying the signal is temporarily interrupted by a switch, and a stored signal is therefore needed for signal continuity, said circuit comprising, in combination:

a low-pass filter (R_1, C_1) and a high-pass filter (C_2, R_3) both arranged to be supplied with a signal from a signal source

through interrupting switch means, said low-pass filter including a connection to a storage capacitor, and



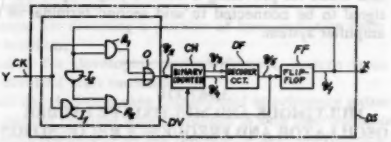
means for adding the outputs of said low-pass filter and of said high-pass filter.

3,967,205

FREQUENCY DIVIDING NETWORK WITH ODD INTEGRAL STEP-DOWN RATIO

Umberto Rossi, Milan, and Pietro Basili, Pedaso, both of Italy, assignors to Societa Italiana Telecommunicazioni Siemens S.p.A., Milan, Italy

Filed June 5, 1975, Ser. No. 583,903
Claims priority, application Italy, June 6, 1974, 23674/74
Int. Cl.² H03K *21/06, 21/36*
U.S. Cl. 328—46 **5 Claims**



1. A frequency-dividing network with a step-down ratio of 1:K where K is an odd integer, comprising:

an input circuit connected to receive an incoming square wave of a basic frequency to be divided, said input circuit being provided with polarity-inverting means;

a binary counter connected to said input circuit for receiving said incoming square wave therefrom;

decoding means connected to said binary counter for generating a control pulse upon the occurrence of a predetermined number of half-cycles of said incoming square wave;

resetting means for said binary counter connected to said decoding means and responsive to said control pulse;

bistable means connected to said decoding means for alternate switchover between a first and a second operating condition by said control pulse, thereby producing an outgoing square wave of reduced frequency; and

feedback means extending from said bistable means to said polarity-inverting means for activating and deactivating same in dependence upon the operating condition of said bistable means to provide a polarity reversal after every K half-cycles of said incoming square wave.

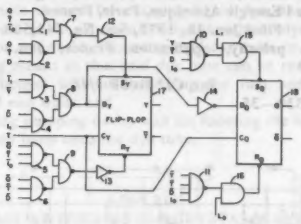
3,967,206

DUAL EDGE AND LEVEL (DEL) FLIP-FLOP

Donald L. Roberson, and Donald K. Fronek, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 19, 1975, Ser. No. 559,953
Int. Cl.² H03K *3/12, 3/286*
U.S. Cl. 328—206 **4 Claims**

1. A dual edge flip-flop means having first through fourth input terminals and first and second flip-flop output terminals; first signal means having waveforms which have both positive and negative edges being connected to supply said first input terminal; second and third signals being connected to said second and third input terminals so as to determine that the flip-flop means is sensitive to positive edges, negative edges, or both positive and negative edges of said first signal or is insensitive to said first signal; and a binary signal being fed to said fourth input terminal such that the outputs on the first and second flip-flop output terminals will assume one binary



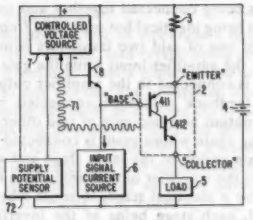
state when the binary signal is a "0" and the opposite state when the binary signal is a "1" when said first signal is fed into said first input terminal to which said second and third signals make the flip-flop sensitive.

3,967,207

AMPLIFIER WITH OVER-CURRENT PROTECTION

Carl Franklin Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 363,600, May 24, 1973, abandoned.
This application Feb. 27, 1975, Ser. No. 553,636
Int. Cl.² H03F *3/04*
U.S. Cl. 330—23 **15 Claims**



4. An amplifier with over-current protection comprising:

an input terminal for receiving an input signal current;

an output terminal for connection to a load;

a common terminal for connection to an operating potential;

transistor means having a base electrode connected to said input terminal, having a collector electrode connected to said output terminal, and having an emitter electrode;

a resistive element with substantially constant resistance connecting the emitter electrode of said transistor means to said common terminal and responsive to the emitter current of said transistor means to develop a potential proportional to that current between said common terminal and said emitter electrode;

a source providing a potential with reference to said common terminal, which potential is responsive to said operating potential so as to decrease as said operating potential decreases below a threshold potential; and

a unilaterally conductive device connecting said source to the base electrode of said transistor means, the direction of relatively easy conduction through said device being such as to limit the excursion of signal potential appearing responsive to said input signal current between the base electrode of said transistor means and said common terminal.

3,967,208
AMPLIFYING INTEGRATED CIRCUIT IN THE MOS TECHNOLOGY

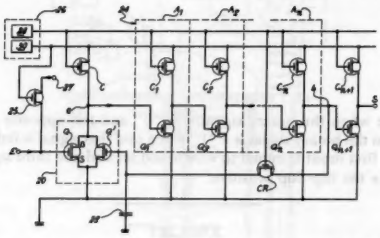
Bernard Baylac; Gérard Merckel, both of Sassenage, and Pierre Meunier, Puteaux, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 16, 1975, Ser. No. 541,568

Claims priority, application France, Jan. 25, 1974, 74.02589

Int. Cl.² H03F *3/16*

U.S. Cl. 330—35 **2 Claims**



1. A negative-feedback band-pass amplifier constructed in accordance with the MOS technology, wherein said amplifier comprises:

an input stage of the summing amplifier type constituted by two MOS transistors each having a doped drain region, a doped source region and a gate, wherein said two MOS transistors have the same geometries and have the same doped drain region, the doped source regions of said transistors being connected together and to ground and their gates being identical but separated from each other, the gate of one of said two transistors being such as to constitute the amplifier input while the gate of the other transistor is connected to the amplifier output,

a negative feedback resistance connected between said amplifier output and said gate of said other transistor,

an amplifying chain whose input is connected to said same doped drain region of the input stage and whose output constitutes the amplifier output, said chain being such as to comprise *n* identical stages in series where *n* is even-numbered, each stage being of the inverting amplifier type constituted by a MOS transistor mounted with a common source connected to ground and a MOS transistor mounted as a load resistance, wherein all the MOS transistors of said chain are interdigitized and constituted by two MOS transistors having identical geometries mounted in parallel and having the same drain, the doped source regions being connected to each other and the gates of said transistors being connected to each other.

3,967,209
DISCRIMINATING SONIC DETECTION SYSTEM

Alexander E. Skoures, Philadelphia, Pa., and Joseph N. Farace, Maple Shade, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 75,662, Sept. 25, 1970, Pat. No. 3,955,171. This application Apr. 27, 1973, Ser. No. 355,996

Int. Cl.² H03F *1/36*; H03K *5/20*

U.S. Cl. 330—86 **5 Claims**

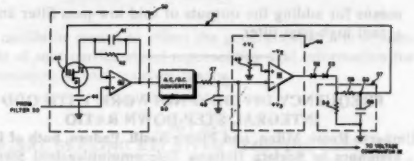
1. A voltage compensator comprising:

an amplifier system adapted to receive at a first terminal an input signal and at a second terminal a feedback signal for providing an output signal of an amplitude indicative of said received signals;

an a.c./d.c. converter connected to receive the output of said amplifier system for providing a d.c. output level;

a first integrator circuit connected to the output of said a.c./d.c. converter for providing a time varying voltage level;

comparator means adapted to receive an input from said integrator circuit for comparing said input to a predetermined voltage level for providing an output of a polarity indicative of which of said voltage levels has a larger magnitude;



a diode connected to the output of said voltage comparator for passing signals of only one polarity; and

a second integrator circuit adapted to receive the output of said diode for providing a time varying output feedback signal to be connected to said second terminal of said amplifier system.

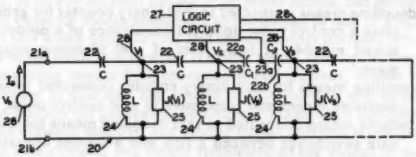
3,967,210
MULTIMODE AND MULTISTATE LADDER OSCILLATOR AND FREQUENCY RECOGNITION DEVICE

Herbert M. Aumann, Acton, Mass., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Nov. 12, 1974, Ser. No. 523,054

Int. Cl.² H03B *7/00*, *25/00*; G01R *23/18*

U.S. Cl. 331—56 **12 Claims**



1. A ladder oscillator frequency recognition device capable of recognizing a chosen positive integer number N selected input signal frequencies impressed thereon, comprising:

a. at least $n-1$ serially connected capacitive impedances;

b. N inductive impedances connected in shunt with said series capacitive impedances to form a ladder network with a node of the ladder network at each connection between said capacitive and inductive impedances;

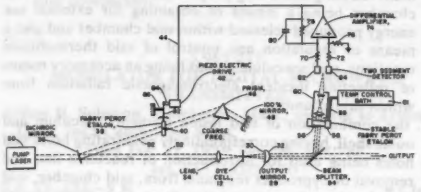
c. said inductive and capacitive impedances being adapted to produce N oscillation modes in response to an input signal impressed on the ladder network, each oscillation mode being at a different frequency and having a unique maximum amplitude standing wave pattern at said nodes of the ladder network, the frequency of the input signal being determinable from the amplitude and phase of the standing wave pattern at said nodes of the ladder network if the frequency of the input signal is substantially equal to one of the N mode frequencies of the ladder network; and

d. means for comparing the signs of the voltages at said nodes of the ladder network to determine which mode the ladder network is oscillating in.

3,967,211
LASER WAVELENGTH STABILIZATION

Irving Itzkan, Boston, and Charles T. Pike, Lexington, both of Mass., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Jan. 17, 1974, Ser. No. 434,078
Int. Cl.² H01S 3/13
U.S. Cl. 331—94.5 S 16 Claims

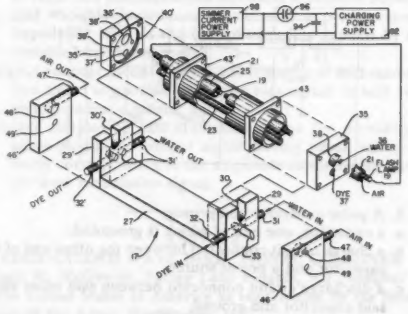


1. A wavelength stabilization system for use in a laser comprising:
a lasing medium;
means for defining the frequency of laser radiation from said medium;
means for diverting a portion of laser radiation from said medium;
means for developing an interference pattern from the diverted laser radiation;
said developing means causing said interference pattern to vary in position with frequency in said laser radiation;
means responsive to the position of said interference pattern for developing an electrical signal representative thereof;
means operative in association with said frequency defining means and responsive to said electrical signal for adjusting the frequency of laser radiation from said lasing medium.

3,967,212
FLASH LAMP PUMPED DYE LASER

Daniel J. Dere, Palo Alto, and Richard W. Wallace, Los Altos, both of Calif., assignors to Chromatix, Inc., Mountain View, Calif.

Filed Aug. 19, 1974, Ser. No. 498,572
Int. Cl.² H01S 3/093, 3/10, 3/02
U.S. Cl. 331—94.5 P 3 Claims

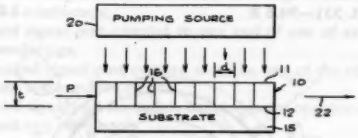


1. Apparatus for optically stimulating a dye laser with a flash lamp, comprising:
means for rigidly supporting a pumping cavity;
first and second optical refracting end walls co-axially mounted on the supporting means for transmitting laser light along an optical light path through the pumping cavity between said end walls;
a flash lamp mounted on the supporting means;
a dye tube removably mounted on the supporting means between the end walls, parallel with the flash lamp and proximate thereto for carrying liquid dye, said optical light path passing longitudinally through the dye tube;
means for removably mounting said dye tube on the supporting means so that said dye tube can be removed or interchanged without disturbing the first and second optical end walls; and
a reflecting pumping cavity wall for focusing the light from the flash lamp onto the dye tube.

3,967,213
X-RAY LASER WITH A SINGLE CRYSTAL WAVEGUIDE STRUCTURE

Amnon Yariv, San Marino, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Mar. 5, 1975, Ser. No. 555,695
Int. Cl.² H01S 3/16
U.S. Cl. 331—94.5 C 10 Claims



1. A laser comprising:
a thin elongated crystal of thickness t between top and bottom sides thereof, said crystal being characterized by a set of prominent atomic planes which are substantially normal to said top side and are spaced from one another by a spacing definable as d, along the crystal length, said crystal having an index of reflection definable as n_c and atoms excitable to emit photons at a wavelength λ;
a substrate in contact with and supporting said crystal at the bottom side thereof, said substrate having an index of refraction definable as n_s, where $n_c > n_s$;
pumping means for pumping energy into said crystal through the top side thereof to excite said excitable atoms to emit said photons, said atomic planes providing Bragg scattering for at least some of said photons to produce a laser beam at wavelength λ which exits said crystal, d and λ being related by the relationship $d \cos \theta = m(\lambda/2)$ where m is an integer and θ is the angle at which said beam exits said crystal with respect to the direction along which said atomic planes are spaced.

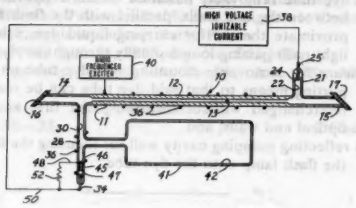
3,967,214
STABILIZING ELECTRODE FOR COLD CATHODE GAS-ION LASER

John B. Thatcher, Cupertino, Calif., assignor to Holosonics, Inc., Richland, Wash.

Filed Jan. 29, 1975, Ser. No. 545,177
Int. Cl.² H01S 3/09
U.S. Cl. 331—94.5 PE 7 Claims

1. In a cold cathode gas-ion laser having an envelope containing a laserable gas with spaced primary discharge electrodes in communication with the laserable gas consisting of an anode and a cathode and having an exciter electrode to initiate the gaseous discharge of the laser:
a stabilizing electrode contacting the laserable gas adjacent the cathode;
said stabilizing electrode being operatively electrically con-

nected to one of the primary discharge electrodes through a load to increase the electrical field strength of



the laser adjacent the cathode during the gas discharge of the laser.

3,967,215

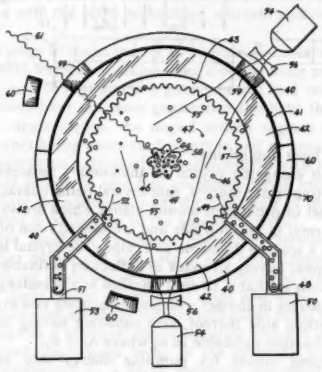
LASER REACTOR

Johannes G. Bellak, Crease Road, Budd Lake, N.J. 07828

Continuation-in-part of Ser. No. 546,375, April 29, 1966, abandoned. This application Aug. 14, 1969, Ser. No. 859,231

Int. Cl.[2] H03F 1/36

U.S. Cl. 331—94.5 R **2 Claims**



1. A lasing reactor for producing and controlling a thermonuclear reactor process thermofusion endo-, equi-, exo-fusion or combinations thereof reactions said lasing reactor comprising:

a. a closed or substantially closed hollow lasing element constructed so as to have focusing properties, said lasing element being in virtue of its lasing material properties and focusing properties a generator of closed or substantially closed respectively coherent electromagnetic waves convergent upon the inherent focal region or focal regions of said lasing element, the outer boundary of said lasing material being substantially reflective to said waves and the inner boundary of said lasing material being substantially emissive to said waves,

b. the hollow portion of said lasing element being and defining a reaction chamber within which said reactions are produced by the convergent impingent closure of said waves upon reactants within said chamber,

c. a speculum and outer shell surrounding said lasing element, said outer shell being a foundation for said lasing reactor and accoutrements, said speculum and outer shell having one or more sets of cooperating closeable orifices beneath which said closeable orifices the said lasing element outer boundary can be reflective where required to the lasing frequency of said lasing element and can be non-reflective to said lasing frequency where required, said closeable orifices being a means of regulation of influx and efflux of electromagnetic energy into and out of said chamber, said influx of electromagnetic energy into said chamber being a means of initially exciting said lasing element, subsequent to and as a result of which excitation influx said lasing element generates a closed or substantially closed respectively convergent coherent electromagnetic wave in conformity with said lasing element focusing and lasing properties, said efflux from said chamber being a means of obtaining for external use energy produced released within said chamber and also a means of regulation anc control of said thermofusion reactions, said speculum means being an accessory means of reflecting incident electromagnetic radiation from within said chamber,

d. the combination of said lasing element, speculum and outer shell, having correspondingly penetrating holes said holes being used for introduction of reactants into and removal of byproduct reactants from, said chamber, said introduction of reactant being from a reactants source means and said removal of byproduct reactants being into a sink means, the cooperation of said source means with said sink means being also a means of regulation and control of said reactions,

and enclosing within said closed or substantially closed hollow lasing element energy released from said reaction produced by said convergent impingence of said closed waves upon reactants within said reaction chamber, said released energy emitted divergently from said reaction impinging therefrom into said lasing element thus reexciting the lasing energy states of said lasing element, said released and emitted energy being feedback energy propagating from said reaction to said lasing element, said feedback energy thereby establishing cooperation between said reaction and said lasing element, said cooperation being a means for sustaining steady-state operation of said lasing reactor.

3,967,216

PULSE GENERATOR STABILIZED FOR CHANGE OF AMBIENT TEMPERATURE AND SOURCE VOLTAGE

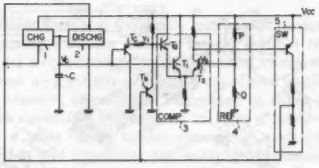
Jyunji Sakamoto; Elsuke Shiratani, and Norio Imaizumi, all of Gunma, Japan, assignors to Tokyo Sanyo Electric Company, Ltd. and Sanyo Electric Co., Ltd., Osaka, both of, Japan

Filed Apr. 2, 1975, Ser. No. 564,635

Claims priority, application Japan, Apr. 3, 1974, 49-38105

Int. Cl.[2] H03K 4/50

U.S. Cl. 331—111 **5 Claims**



1. A pulse generator comprising:

a. a capacitor, one end of which is grounded;

b. a charge circuit connected between the other end of said capacitor and a power source;

c. a discharge circuit connected between said other end of said capacitor and ground;

d. a comparator having first, second and third transistors, the emitters of these transistors being commonly connected and grounded through a first resistor, the base of the first transistor being connected to said other end of said capacitor, the base of the second transistor being connected to a constant reference voltage source, the

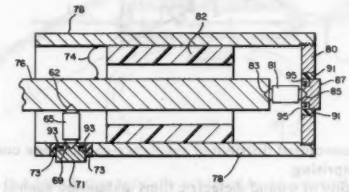
base of the third transistor being connected to said other end of said capacitor through a second resistor and an additional transistor, and said base of the third transistor being further connected to the voltage source through a third resistor under the control of a switching transistor; and

e. a switching circuit coupled to an output of said comparator for switching said charge circuit, said discharge circuit and said switching transistor according to the output of said comparator.

3,967,217
MODULATOR FOR DIGITAL MICROWAVE TRANSMITTER

Arthur H. Solomon, Winchester, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Jan. 31, 1975, Ser. No. 545,788
Int. Cl.² H03C 3/00
U.S. Cl. 332—9 R **9 Claims**



1. A phase modulator for a digital communication transmitter having as a modulation signal a multiple level signal with a time average of substantially zero amplitude, said phase modulator comprising:

means for receiving a carrier signal of predetermined frequency;

a transmission line coupled to said receiving means for propagation of said carrier signal;

a plurality of bias responsive variable impedance means coupled to said transmission line at predetermined spaced positions;

phase-shifting means disposed in the propagation path of said transmission line between said variable impedance means and having a dielectric core at least partially filling the space beween the transmission line conductors, the material and geometry of said dielectric core being such to result in a predetermined electrical separation between said variable impedance means and a predetermined impedance level of the transmission line as seen by the variable impedance means;

digital encoder means operative in response to said modulation signal to provide respective bias signals to said variable impedance means; and

means coupled to said transmission line for providing a phase-modulated output signal having phase states directly corresponding to the amplitude states of said multiple level modulation signal.

3,967,218
EDGE-GUIDED WAVE DIRECTIONAL COMBINER

Joseph W. McGowan, Spring Lake Heights, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 26, 1975, Ser. No. 617,210
Int. Cl.² H01P 1/34
U.S. Cl. 333—1.1 **11 Claims**

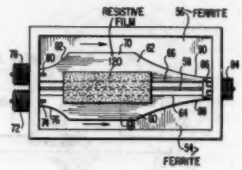
1. An edge-guided mode microwave transmission device, comprising in combination:

a ground plane;

ferromagnetic substrate means of a predetermined thickness located on said ground plane;

at least two mutually separated stripline conductors of substantially like conductor patterns formed on said substrate means, each pattern having a pair of conductive edges, one edge of which includes at least one tapered edge segment adapted to effect energy transfer therealong for a predetermined biasing magnetic field;

means providing a biasing magnetic field of a predetermined magnitude and which is applied transverse to said ground plane;



resistive load means commonly applied over a predetermined length of the other conductive edge of said at least two conductors;

a first signal port coupled to one end of one of said two conductors;

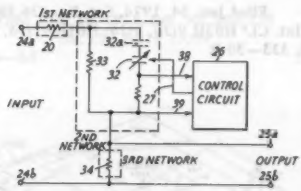
a second signal port coupled to a like end of the other of said two conductors; and

a third signal port commonly coupled to the opposite end of said two conductors.

3,967,219
SIGNAL COMPRESSORS AND EXPANDERS

Ray Milton Dolby, San Francisco, Calif., assignor to Dolby Laboratories, Inc., San Francisco, Calif.

Continuation of Ser. No. 432,171, Jan. 10, 1974, abandoned, which is a continuation of Ser. No. 232,113, March 6, 1972, abandoned. This application Sept. 25, 1974, Ser. No. 509,076
Claims priority, application United Kingdom, Mar. 12, 1971, 6747/71
Int. Cl.² H04B 1/64; H03H 7/10, 7/16; H03G 11/04
U.S. Cl. 333—14 **26 Claims**



1. A circuit for modifying the dynamic range of an input signal, comprising input terminals and two terminal impedance means connected in series between the input terminals to provide an output signal derived from at least part of the impedance means, the impedance means including a frequency selective means determining a frequency band in which no modification of dynamic range takes place, and a restricted frequency band within which the modification of dynamic range takes place and including variable circuit means responsive to the level of signal components in the restricted band to reduce the degree of dynamic range modification as the level of such components increases, the variable circuit means being constructed and arranged to narrow the restricted band as the level of signal components within the restricted band increases above a level predetermined at −20dB or less, thereby to broaden the band in which no modi-

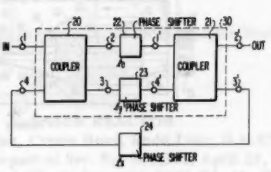
fication of dynamic range takes place and to exclude such signal components from dynamic range modification.

3,967,220

VARIABLE DELAY EQUALIZER

Yoshimi Tagashira; Masaaki Atobe, and Kazuhiro Yamamoto, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed July 31, 1975, Ser. No. 600,682
Claims priority, application Japan, Aug. 19, 1974, 49-94716
Int. Cl.² H03H 7/14; H01P 1/20
U.S. Cl. 333—28 R 1 Claim



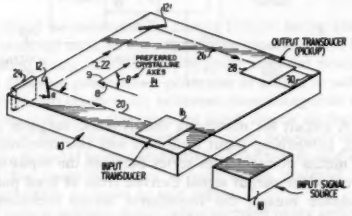
1. A variable delay equalizer comprising:
first and second directional couplers each having a pair of input terminals and a pair of output terminals;
first and second variable phase shifters inserted respectively between the first output terminal of said first directional coupler and the first input terminal of said second directional coupler and between the second output terminal of said first directional coupler and the second input terminal of said second directional coupler, and;
a third variable phase shifter inserted between the second output terminal of said second directional coupler and the second input terminal of said first directional coupler.

3,967,221

SURFACE ACOUSTIC WAVE DELAY LINE WITH BULK WAVE DISCRIMINATION

Herbert Warren Cooper, Hyattsville; John Acevedo, Linthicum, both of Md., and John deKlerk, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 24, 1974, Ser. No. 436,281
Int. Cl.² H03H 9/30, 9/26; H01L 41/18, 41/10
U.S. Cl. 333—30 R 10 Claims



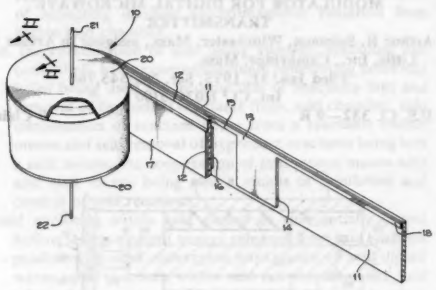
8. A surface wave device comprising:
an acoustic substrate having an acoustic discontinuity in one surface thereof, said acoustic discontinuity defining a single surface wave reflecting surface extending beneath said one surface of said substrate sufficiently to reflect a substantial amount of incident surface wave energy propagated along said surface of said substrate without reflecting a substantial amount of bulk wave energy propagated through said substrate; and,
means for launching acoustic surface waves along said one surface of said substrate in a propagation path intersecting said reflecting surface defined by said discontinuity.

3,967,222

DISTRIBUTED RESISTANCE-CAPACITANCE COMPONENT

Joseph A. Toro, Ogallala, Nebr., assignor to TRW Inc., Los Angeles, Calif.

Filed May 27, 1975, Ser. No. 581,156
Int. Cl.² H03H 7/06; H01G 4/40
U.S. Cl. 333—70 CR 15 Claims



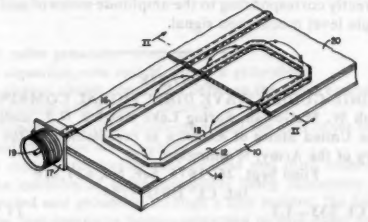
1. A convoluted distributed resistance-capacitance component comprising:
a plurality of wound dielectric films juxtaposed against each other including at least one duplex film having metallized layers on surfaces of both sides and at least one simplex film having a metallized layer on only one surface with said metallized layer on said simplex film being in direct contact with one of said metallized layers on said duplex film, said metallized layers. being geometrically shaped with margins to provide distributed resistance along each of said metallized layers and capacitance between each of said metallized layers, and
lead means coupled to each of said metallized layers to provide electrical input and output terminals to thereby provide a component having resistance provided by said distributed resistance along each of said metallized layers and capacitance provided between each of said metallized layers.

3,967,223

RESONANT RING TRANSMISSION LINE HAVING A HIGH Q MODE

Bruce R. McAvoy, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 443,887, Feb. 19, 1974, abandoned. This application Feb. 18, 1975, Ser. No. 550,786
Int. Cl.² H01P 3/08, 7/00
U.S. Cl. 333—82 B 13 Claims



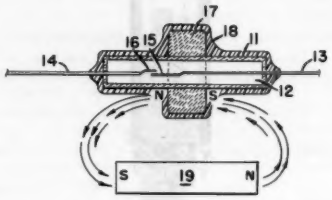
10. A surface wave resonant ring transmission line comprising:

a substrate of dielectric material,
a resonant ring of electrically conductive material deposited on said substrate,
a layer of dielectric material deposited on and covering said resonant ring, and
means for coupling the E field of an electromagnetic wave to said ring causing a surface wave to be created and propagated on said ring.

3,967,224
COATED MAGNETICALLY BIASED REED SWITCH

Robert L. Seeley, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1975, Ser. No. 571,658
Int. Cl.² H01H 1/66
U.S. Cl. 335—151 **1 Claim**



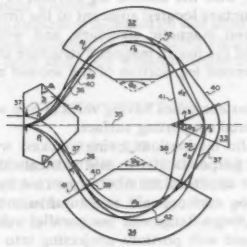
1. In a switch magnetically actuated by an external magnetic field having a tubular glass envelope containing a pair of longitudinally extending reed contacts, an improvement therefor is provided comprising:
a donut-shaped piece of rubber-bonded barium-ferrite magnetic material having a lateral hole sized to snugly fit about the tubular glass envelope to easily facilitate its positioning and mounting on the envelope mounted to encompass the circumference of the tubular glass envelope for magnetically biasing the reed contacts radially to a predetermined position, the circumferential mounting being mandatory to ensure reliable actuation of the switch by an omniradially disposed external magnetic field and
a cured epoxy coating completely covering said switch and donut-shaped piece of rubber bonded barium-ferrite material to further insure greater reliability.

3,967,225
MAGNETIC BEAM DEFLECTOR SYSTEM

Edward A. Heighway, Deep River, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Mar. 3, 1975, Ser. No. 554,563
Claims priority, application Canada, Aug. 15, 1974, 207147
Int. Cl.² H01F 7/00
U.S. Cl. 335—210 **6 Claims**

1. A magnetic deflector system for deflecting a particle beam through 180° and having coincident beam entry and axis comprising:
first dipole magnet means having an edge perpendicular to said entry axis to receive said beam and positioned symmetrically about a symmetry plane through said entry axis, said first magnet means adapted to deflect said beam away from said symmetry plane through an angle θ_1 with a bending radius ρ_1;
second dipole magnet means positioned to one side of said symmetry plane at a distance d_1 from said first magnet means and adapted to deflect said beam toward said symmetry plane through an angle θ_2 with a bending radius ρ_2;
third dipole magnet means positioned symmetrically about said symmetry plane at a distance d_2 from said second magnet means and adapted to deflect said beam through said symmetry plane through an angle θ_3 with a bending radius ρ_3;
fourth dipole magnet means positioned to the other side of said symmetry plane symmetrically with said second magnet means at a distance d_1 and d_2 from said third magnet means and said first magnet means respectively and adapted to deflect the beam through an angle θ_2 with a bending radius ρ_2 to said first magnet means;



said first magnet further adapted to deflect the beam received from said fourth magnet means through an angle θ_1 with a bending radius ρ_1 to eject the beam along the exit axis;
the zeroth order beam path through said magnet means being defined by:

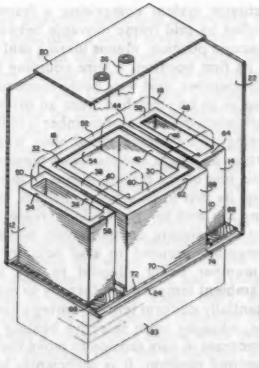
$$\theta_2 = \theta_1 + \theta_3 + 90° \text{ and}$$

$$d_2 = \left\{ \frac{d_1 \sin\theta_3 + \rho_1 (1-\cos\theta_3) - \rho_3 \left|\sin\theta_3\right| - \rho_3(\cos\theta_3 + \sin\theta_3)}{\cos\theta_2} \right\}$$

3,967,226
ELECTRICAL INDUCTIVE APPARATUS HAVING MAGNETIC SHIELDING CORES AND A GAPPED MAIN CORE STRUCTURE

Saul Bennon, and William D. Albright, both of Muncie, Ind., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 10, 1975, Ser. No. 585,730
Int. Cl.² H01F 15/04
U.S. Cl. 336—84 **2 Claims**



1. Electrical inductive apparatus comprising:

first, second, third and fourth rectangular magnetic structures each having first and second leg portions and first and second yoke portions constructed of stacked metallic laminations;

a winding structure inductively coupled to said magnetic structures;

said first magnetic structure being surrounded by said second magnetic structure, with said first and second magnetic structures being spaced from each other to form first and second gaps between their adjacent yoke portions and third and fourth gaps between their adjacent leg portions, with the second leg portion of the third magnetic structure located adjacent to the first leg portion of the second magnetic structure, and with the first leg portion of the fourth magnetic structure located adjacent to the second leg portion of the second magnetic structure;

an apparatus enclosure having vertical side walls which join a horizontal supporting surface;

said metallic laminations being stacked with their faces oriented perpendicular to said vertical side walls; and

at least one structural member supported by the horizontal supporting surface, said structural member including a beam having a flange and two parallel web portions, with one of said web portions projecting into said third gap, and with the other of said web portions located between the first leg portion of the second magnetic structure and the second leg portion of the third magnetic structure.

3,967,227

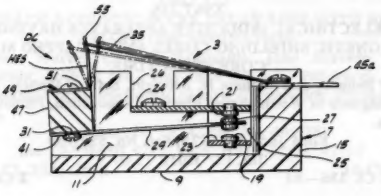
ACTUATOR SYSTEM WITH AMBIENT TEMPERATURE COMPENSATION

David E. Clarke, Attleboro; Robert P. Lackey, North Attleboro, and Joel P. Clark, Plainville, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 10, 1975, Ser. No. 535,940

Int. Cl.² H01H 71/22

U.S. Cl. 337—124 **21 Claims**



1. An actuator system comprising a frame, an actuator member carried by said frame movable between a first position and a second position, means biasing said actuator member toward its first position, a wire coupling said frame and said actuator member, said wire being tensioned by said biasing means so as to be stretched from an original length to a second length when the actuator member is in its first position, said wire being of a selected metal alloy which upon being heated shortens its length and increases tension in the wire to overcome the bias of the biasing means to move the actuator member from its first to its second position, means for selectively heating the wire to effect said increase in wire tension, and ambient temperature compensation means comprising a bimetallic member secured to said actuator member, said bimetallic member being adapted to flex in response to changes in ambient temperature thereby to maintain the wire under substantially uniform tension during changes in ambient temperature, whereby upon selective heating of said wire to effect said increase in wire tension to move the actuator member to its second position, it is sufficiently heated to effect movement of said actuator member from its first to its second position without overstressing the wire.

3,967,228

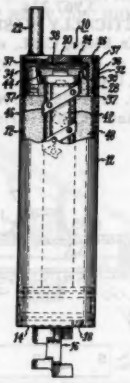
ELECTRIC CURRENT LIMITING FUSE HAVING A FILTER DISPOSED IN ONE END CAP

Robert E. Koch, Pittsfield, and James H. Ceder, Lenox, both of Mass., assignors to General Electric Company

Filed Oct. 9, 1975, Ser. No. 621,053

Int. Cl.² H01H 85/14

U.S. Cl. 337—248 **5 Claims**



1. A current limiting fuse of the type including an electrically insulating cartridge;

a pair of electrically conductive terminal caps at opposite ends of said cartridge;

a fusible element within said cartridge in electrical contact with said terminals; and

a filling of packed particulate matter of high electrical resistivity and high dielectric strength within said cartridge surrounding and providing a porous enclosure for said fusible element, at least that portion of said packed particulate matter immediately surrounding said fusible element being bound into a rigid self-supporting adhering body by an inorganic binder added thereto, wherein the improvement comprises that one of said terminal end caps has a filter disposed on its inside surface overlapping a drain port.

3,967,229

HIGH-DUTY PTC-RESISTOR AND METHOD FOR ITS MANUFACTURE

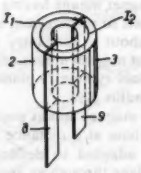
Holger Wilhelm Vind, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Nov. 6, 1974, Ser. No. 521,244

Claims priority, application Germany, Nov. 14, 1973, 2356765

Int. Cl.² H01C 7/00

U.S. Cl. 338—13 **3 Claims**



1. A heavy duty PTC resistor comprising two pressed and sintered bodies of a ceramic composition, each of said bodies

having two end faces each carrying a connection contact, said end faces extending parallel to the direction of the force with which the associated one of said bodies was loaded during pressing, said resistor having the form of two halves of a hollow cylinder, said end faces being in radial planes of said cylinder.

3,967,230

RESISTOR BUILT-IN SPARK PLUG

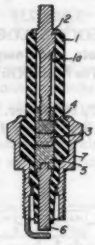
Osami Kamigaito; Haruo Doi; Hideyuki Masaki; Toshio Kandori; Masami Oki, and Yasuo Nakamura, all of Nagoya, Japan, assignors to Nippondenso Co., Ltd. and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of, Japan

Filed Oct. 22, 1974, Ser. No. 517,053

Claims priority, application Japan, Nov. 12, 1973, 48-127032

Int. Cl.² H01C *1/06, 7/06*

U.S. Cl. 338—66 **12 Claims**



1. A resistor built-in spark plug comprising an insulator formed with an axially extending inner hole, a stem fitted in the upper part of said hole in said insulator, a center electrode fitted in the lower part of said hole, a resistor disposed in the central part of said hole, and copper-glass electrode layers disposed between said resistor and said stem and between said resistor and said center electrode, said resistor being made by firing and solidifying powder of resistor mixture consisting of 75 to 38 volume percent of main resistor component containing tin oxide and 25 to 62 volume percent of glass powder with softening temperature of 300° to 600°C, and said copper-glass electrode layers being made by firing and solidifying a mixture of copper powder and glass powder with the softening temperature of above 530°C and more than 30°C higher than the softening point of glass in the resistor portion.

3,967,231

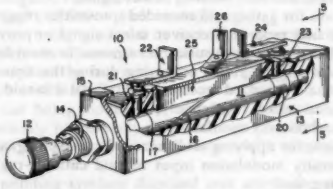
VARIABLE RESISTOR WITH PLUG-IN RESISTANCE ELEMENT

Chester L. Hout, Box 235, Atlanta, Ill. 61723

Filed Mar. 31, 1975, Ser. No. 563,805

Int. Cl.² H01C *10/26*

U.S. Cl. 338—117 **8 Claims**



1. In a variable resistor including

means providing a resistance element,

a body housing said resistance element,

first contact means in said body for providing an electrically conductive contact with said resistance element at a constant position along its length,

second contact means in said body for providing an electrically conductive contact with said resistance element at a variable position of contact along its length,

a shaft means journaled in said body with one end being accessible from the exterior thereof and which is rotatable from said accessible end for varying the relative position of contact of said second contact means along said resistance element,

the improvement wherein;

said resistance element is mounted on said shaft means, and

said shaft means including said resistance element is readily removable from said body without dismantling same.

-3,967,232

METHODS OF DETECTING UNDERWATER OBJECTS AND APPARATUS THEREFOR

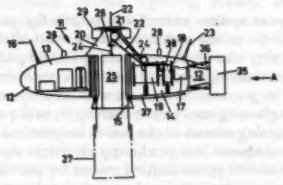
Noel Mills, and Geoffrey Peter Warley, both of Yeovil, England, assignors to Westland Aircraft Limited, Yeovil, England

Filed June 28, 1973, Ser. No. 373,480

Claims priority, application United Kingdom, June 29, 1972, 30584/72

Int. Cl.² G08B *13/00*

U.S. Cl. 340—2 **7 Claims**

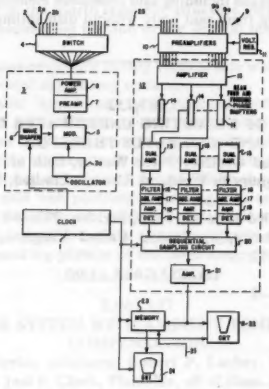


2. Underwater detection apparatus comprising in combination, a buoyant structure, a sonar body housed in a generally vertical aperture within the buoyant structure, first and second cable drums located in the buoyant structure and being operable by a motor and clutch means located in the structure, a cable wound on the first cable drum and routed upwardly for releasable attachment to a helicopter so that rotation of the first drum is effective to raise and lower the buoyant structure relative the helicopter, the cable being constructed and arranged to carry electrical power and control signals when attached to the helicopter, a cable wound on the second cable drum and routed downwardly to support the sonar body so that rotation of the second cable drum is effective to raise and lower the sonar body relative the buoyant structure, the cable being constructed and arranged to carry electrical power to operate the sonar body, an electrical power supply carried by the buoyant structure for operating the sonar body and a transmitting means when the cable from the first drum is detached from the helicopter, and flotation means on the cable from the first drum and located adjacent the end arranged for releasable attachment to the helicopter.

3,967,233
SONAR SYSTEM FOR CLASSIFYING SUBMERGED OBJECTS

Pierre Maguer, Le-Relecq-Kerhuon, and Paul Gourlay, Vanves, both of France, assignors to Etat Francais, France

Filed Aug. 8, 1974, Ser. No. 495,905
Claims priority, application France, Aug. 16, 1973, 73.29806
Int. Cl.² G01S 9/66, 7/62
U.S. Cl. 340—3 R 7 Claims



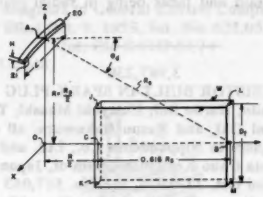
1. A sonar system comprising means for generating very short acoustic pulses comprising very short ultrasonic waves; a transmitting transducer connected to said pulse generating means for transmitting said pulses; a receiving transducer mounted on a common support with said transmitting transducer for pivoting movement therewith, said receiving transducer receiving echoes of the pulses transmitted by said transmitting transducer and producing electrical signals in accordance therewith; phase shifting means for providing predetermined phase shifting of the electrical signals produced by said receiving transducer; means forming a plurality of monitoring channels for combining the outputs of said phase shifting means; means for sequentially sampling the outputs of said mointoring channels; at least one display means for displaying the output of said sampling means so as to provide a visual representation of the echoes received by said receiving transducer; means for focusing said receiving transducer inside the Fresnel region of said receiving transducer; and, timing means for synchronizing the acoustic transmission of said transmitting transducer, the operation of said sampling means and the operation of said display means.

3,967,234
DEPTH-OF-FIELD ARC-TRANSDUCER AND SONAR SYSTEM

Charles H. Jones, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 6, 1974, Ser. No. 448,596
Int. Cl.² H04B 13/00
U.S. Cl. 340—8 R 7 Claims

1. A large depth-of-field transducer for use in sonar systems, said transducer comprising at least one transducer element positioned along an arc of a circle having a radius R and having an arc length L, said transducer element having an active face along its length including a midpoint, said face being directed toward a point lying on a line normal to the plane defined by the arc and passing through the center of said

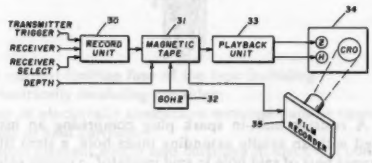


arc, said point being spaced from said midpoint by a distance R_s, and said radius R being equal to about 0.3 to 0.6 R_s.

3,967,235
ACOUSTIC VELOCITY LOGGING SYSTEM

Charles L. Dennis, De Soto, and Joseph Zemanek, Jr., Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed July 17, 1974, Ser. No. 489,214
Int. Cl.² G01V 1/40
U.S. Cl. 340—15.5 DS 10 Claims



1. An acoustic velocity logging system comprising:

a. a transducer assembly adapted for movement through a borehole, including:
   i. a transmitter of acoustic pulses,
   ii. a pulse generator for energizing said transmitter and for producing a transmitter trigger pulse each time said transmitter is energized,
   iii. first and second receivers located at different, spaced-apart, axial distances from said transmitter, each receiver producing an output signal representative of the acoustic pulses traveling through the formation surrounding the borehole from the transmitter to the receiver,
   iv. means for selectively providing one of said receiver signals along with each of said transmitter trigger pulses and for providing a receiver select signal of a first state when the output from said first receiver is being provided and of a second state when the output from said second receiver is being provided,

b. means located uphole from the transducer assembly for recording said transmitter trigger pulses, said receiver signals, and said receiver select signal,

c. means for gating said recorded transmitter trigger pulses and said recorded receiver select signal to provide first and second trigger pulses in response to recorded transmitter trigger pulses occurring during the time periods that said recorded receiver select signal is in said first and second states, respectively,

d. a cathode-ray oscilloscope,

e. means for applying said recorded receiver signals to the intensity modulation input of said cathode-ray oscilloscope, and

f. means for selectively applying either said first or second trigger pulses to the horizontal sweep input of said cathode-ray oscilloscope to trigger the sweep of the electron

beam of the cathode-ray oscilloscope whereby each sweep of the electron beam is modulated to produce a variable-density display of the recorded receiver outputs from either said first or second receiver.

10. In a borehole logging system having a transducer assembly including a transmitter for producing bursts of acoustic energy pulses and a plurality of receivers for producing signals representative of said acoustic pulses traveling from said transmitting means to each of said plurality of receiving means through the formation adjacent the borehole as the assembly is moved through the borehole, a method for recording and displaying said signals, comprising:

a. producing a source of first reference pulses,

b. recording said signals on magnetic tape at the rate of said first reference pulses,

c. recording a control signal on said magnetic tape, the rate of said control signal being representative of the rate of said first reference pulses,

d. recording receiver select signals to indicate the receiver whose signal is being recorded at any given time,

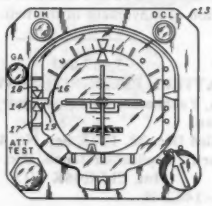
e. applying successively recorded receiver signals to the intensity modulation input of a cathode-ray oscilloscope, and

f. triggering the electron beam sweep of the cathode-ray oscilloscope in response to those recorded receiver select signals that identify the time periods on said recording during which signals from a common receiver have been recorded whereby successive electron beam sweeps are intensity modulated with successive receiver signals from a common receiver.

3,967,236
COMMAND CUE FOR A FLIGHT DIRECTOR INSTRUMENT

John Peter Dietrich, Glendale, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,322
Int. Cl.² G08G 5/00
U.S. Cl. 340—27 AT **4 Claims**



1. An indicator in a flight director instrument for use in rotary wing aircraft having a collective pitch control stick which is normally disposed for generally vertical control motions with respect to said aircraft for controlling collective pitch by generally vertical manual movement of said stick, said indicator comprising

an elongated bar shaped cue generally resembling the shape of said collective pitch control stick,

said cue being mounted in said flight director instrument which when in use in said aircraft is part of a flight director system having means for moving said cue in accordance with a collective pitch command,

said cue being mounted in said flight director instrument normally horizontally disposed with respect to said aircraft for generally vertical motion with respect thereto, and

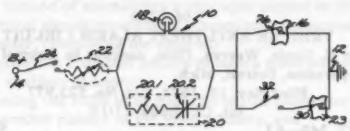
two pointing symbols disposed one above the other and associated with said cue to define a central position therefor, the upper of said two symbols pointing downwardly and the lower of said two symbols pointing upwardly, the region between said two symbols defining said central position for said cue, said symbols pointing in the respective directions to move said collective pitch control stick so as to center said cue at said central position when said cue in deviating from said central position becomes associated with one of said symbols, thereby satisfying said collective pitch command, said cue exhibiting vertical deviations above and below said central position in accordance with said collective pitch command,

said control stick shaped cue, said vertical deviations thereof and said pointing symbols tending to engender an instinctive reaction associating said cue with said control stick and said deviations and pointing symbols with the direction to move said control stick to satisfy said collective pitch command, thereby engendering an instinctive reaction to position said control stick in the proper direction to satisfy said collective pitch command.

3,967,237
AUTOMOTIVE SEAT BELT MONITORING SYSTEM

Richard L. Jenne, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 1, 1974, Ser. No. 520,188
Int. Cl.² B60R 21/10
U.S. Cl. 340—52 E **13 Claims**



1. A seat belt monitoring system for a motor vehicle having seat belt means and electrical power supply means comprising electrically operable audible signaling means, electrically operable visual signaling means, first switch means operable in response to initiation of motor vehicle operation for electrically connecting said signaling means to said power supply means to permit operation of said signaling means, additional switch means operable in response to fastening of said seat belt means to prevent operation of at least one of said signaling means when said seat belt means is fastened, and electrical resistor means adapted to display selected change in resistivity with a selected temperature change arranged to be subjected to said selected temperature change within a selected time in response to initiation of said motor vehicle operation for preventing operation of at least a selected signaling means of said system after said selected time.

3,967,238
LOW-BRAKE FLUID SENSOR

Robert R. Ridpath, Rosemont, Pa.; Louis R. Clifford, Woodbury, and Hendrik Groot, Cherry Hill, both of N.J., assignors to TRW Inc., Los Angeles, Calif.

Filed Dec. 16, 1974, Ser. No. 532,882
Int. Cl.² G08B 21/00
U.S. Cl. 340—59 **16 Claims**

1. A fluid sensor system for sensing the level of fluid in a container comprising:

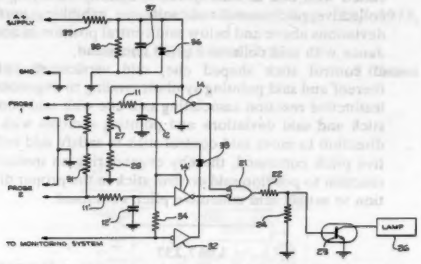
electrical supply means for supplying an electrical potential,

electrical probe means coupled to said electrical supply means and inserted into the fluid for providing an electrical signal in proportion to the level of fluid in the container,

detector circuit means coupled to said probe means for detecting said electrical signals, said detector circuit means including an integrator circuit coupled to said probe means for integrating said electrical signal with respect to time, said detector circuit further including an amplifier having an input coupled to the output of said

integrating circuit for amplifying said integrated electrical signal, and

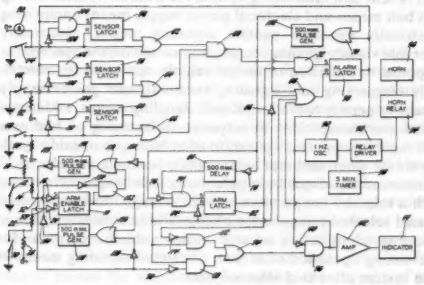
switching means operatively coupled to said detector circuit means and responsive to said amplifier, said switching means being operable to be switched from one stable state to a second stable state in response to a predetermined signal from said detector circuit to provide an accurate alarm signal in response to a reduced level of said fluid.



3,967,239
VEHICLE ANTI-THEFT ALARM CIRCUIT

Robert E. Steele, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 15, 1974, Ser. No. 523,977
Int. Cl.² B60R *25/10*
U.S. Cl. 340—63 **5 Claims**

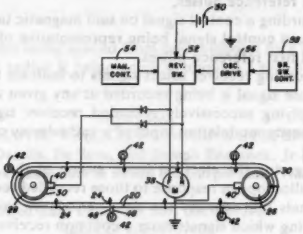


1. An anti-theft alarm circuit for a motor vehicle comprising sensor switch means for assuming first and second states in response to the opening and closing respectively of a vehicle compartment, signaling means, key operated switch means movable from a neutral position to an ARM position or a DISARM position, ARM ENABLE latch means connected with said key operated switch means and triggerable to an ARM ENABLE state upon movement of said key operated switch means to said ARM position and triggerable to a DISARM ENABLE state upon movement of said key operated switch means to said DISARM position, ARM latch means for establishing a circuit arming condition if said sensor switch means is in said second state and said ARM ENABLE latch means is in said ARM ENABLE state, ALARM latch means responsive to said sensor switch means assuming said first state after said arming condition has been established for energizing said signaling means, indicator means, logic means responsive to the state of said ARM ENABLE latch means and said ARM latch means and to the position of said key operated switch means for energizing said indicator means while said key operated switch means is in said ARM position if said ARM ENABLE latch means is triggered to said ARM ENABLE state and for deenergizing said indicator means when said key operated switch is returned to said neutral position unless said ARM latch means does not establish said circuit arming condition.

3,967,240
DIRECTIONAL SIGNAL

J. Ridgely Young, Edmonton, Canada, assignor to Kay Melinda Brownlee, Edmonton, Canada

Filed July 15, 1975, Ser. No. 596,152
Int. Cl.² B60Q *1/26, 1/34;* G08B *5/00*
U.S. Cl. 340—73 **8 Claims**

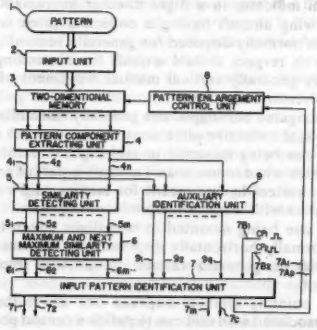


6. In a signal system for vehicles or the like incorporating a source of electrical energy, a pair of spaced pulleys, an endless belt mounted on said pulleys for travel thereabout, said endless belt incorporating electrical conductor means, a series of lamps mounted at spaced points along said belt and in current receiving communication with the conductor means, cooperative current transferring means for effecting current transfer from said source to said pulleys and from said pulleys to the conductor means of the belt, reversible electric motor means drivingly engaged with one of said pulleys for a selective driving thereof in either direction, switch means for controlling the direction of operation of said motor, and turn signal means for operating said switch means in accordance with the desired direction of movement of the belt.

3,967,241
PATTERN RECOGNITION SYSTEM

Ryuichi Kawa, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1973, Ser. No. 429,342
Claims priority, application Japan, Dec. 31, 1972, 48-310
Int. Cl.² G06K *9/12*
U.S. Cl. 340—146.3 H **5 Claims**



1. A pattern recognition system comprising

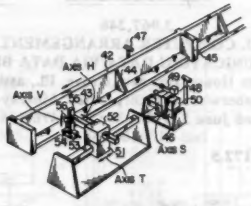
a. pattern input means adapted to read an input pattern and to convert it into quantized electrical video signals;
b. a two-dimensional memory adapted to store therein said electrical video signals as an input pattern information;
c. similarity detecting means adapted to detect the degree of similarity of said input pattern information with stored standard patterns of different categories;
d. input pattern identification means adapted to establish one-to-one correspondence between said input pattern information and one of said standard patterns when the degree of similarity of said input pattern information to only one standard pattern is high, and also adapted to provide an input pattern enlargement signal when the degree of similarity of said input pattern information with at least two of said standard patterns is high;
e. an input pattern information enlargement control means adapted to enlarge a selected part of said input pattern information stored in said two-dimensional memory in response to said input pattern enlargement signal from said identification means; and
f. an auxiliary input pattern identification means adapted to extract selected features of said enlarged input pattern information so as to identify and establish a one-to-one correspondence between said enlarged input pattern information and only one of said plurality of standard patterns.

3,967,242

AUTOMATIC WORKING MACHINE

Osamu Isoo; Shinji Matsuoka; Shigeru Matsuoka, all of Hitachi; Takeshi Uno, Sayama; Sadahiro Ikeda, Tokyo; Ikuro Masuda, and Koji Kurokawa, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed June 13, 1974, Ser. No. 479,080
Claims priority, application Japan, June 15, 1973, 48-66918
Int. Cl.² G06K 9/00
U.S. Cl. 340—146.3 H **5 Claims**



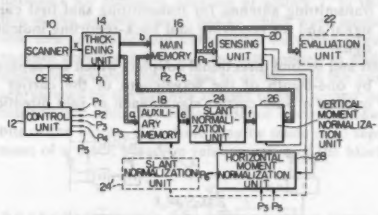
1. An automatic working machine comprising:
a television image input device for obtaining an optical image of a moving object to be worked and for converting the optical image into electrical signals;
means for detecting the kind of object to be worked including means providing at least one predetermined range of level of electrical signals assumed for the shape of predetermined objects to be worked in an image plane of said television input device, means for measuring the area of the object to be worked in accordance with the electrical signals provided by said television input device obtaining an optical image of the moving object to be worked, and means for comparing the electrical signals of the measured area with the at least one predetermined range of electrical signals to detect the kind of object to be worked; and
a working unit for effecting a predetermined work on the object to be worked in response to the result of detection of said detecting means.

3,967,243

CHARACTER PATTERN NORMALIZATION METHOD AND APPARATUS FOR OPTICAL CHARACTER RECOGNITION SYSTEM

Ryuichi Kawa, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed July 5, 1974, Ser. No. 486,246
Claims priority, application Japan, July 9, 1973, 48-77304; Nov. 6, 1973, 48-128208[U]
Int. Cl.² G06K 9/12
U.S. Cl. 340—146.3 H **17 Claims**



1. A method of normalizing a character pattern in the form of electrical signals constituting a quantized representation of a character, comprising the steps of:
a. storing the character pattern in both a main memory and an auxiliary memory;
b. sensing the value of at least one spatial parameter of the character pattern in the main memory; and
c. normalizing the at least one spatial parameter while transferring the character pattern from the auxiliary memory to the main memory in accordance with the sensed value;
the at least one spatial parameter including the slant of the character pattern, said main and auxiliary memories comprising rectangular arrays of memory elements corresponding to respective points of the character pattern;
step (c) comprising, for each respective column of memory elements of the main and auxiliary memories:
gating electrical signals from memory elements of the auxiliary memory to memory elements of the main memory, said memory elements of the main memory to which the electrical signals are gated being said respective column of memory elements, said memory elements of said auxiliary memory from which the electrical signals are gated being spaced to the left of said respective column of memory elements to normalize leftward slant and being spaced to the right of said respective column of memory elements to normalize rightward slant, a spacing of said memory elements of said auxiliary memory from which the electrical signals are gated progressively increasing from a bottom of said auxiliary memory relative to a top of said auxiliary memory.

3,967,244

APPARATUS FOR THE WIRELESS TRANSMISSION OF A CONTROL SIGNAL TO THE CONTROL PATH OF A CONTROLLED SEMICONDUCTOR VALVE

Stefan Frese, Vienna, Austria, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed June 5, 1975, Ser. No. 584,009
Claims priority, application Germany, June 10, 1974, 2427951
Int. Cl.² H04B 1/00
U.S. Cl. 340—171 PF **2 Claims**

1. Apparatus for the wireless transmission of a control signal to the control path of a controllable semiconductor valve comprising:
a receiving location including:

a receiving antenna for receiving a first modulated carrier signal and for transmitting a back-reporting indication signal;

a first demodulator responsive to said first carrier signal and having an output connected to said control path;

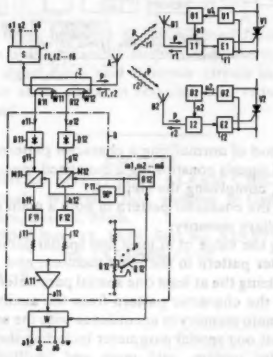
and means responsive to the state of said valve for developing an amplitude modulated signal which comprises said back reporting indication signal; and a transmitting location including:

means for generating a carrier signal;

a first modulator responsive to said carrier signal and to said control signal for generating said first modulated carrier signal;

a transmitting antenna for transmitting said first carrier signal and for receiving said back-reporting indication signal;

first and second directional couplers which are separated by one-eighth of the wavelength of the carrier frequency of said carrier signal, each of said directional



couplers having a branch line and main line, the main line of said first coupler being connected at one end of said first modulator and at the other end to one end of said main line of said second coupler, the other end of the main line of said second coupler being connected to said antenna;

first and second AM demodulators connected to the branch lines of said first and second couplers, respectively;

means for generating sinusoidal and cosinusoidal signals of a predetermined local frequency;

a first mixer responsive to the output of said first AM demodulator and to said cosinusoidal signal;

a second mixer responsive to the output of said second AM demodulator and to said sinusoidal signal;

first and second lowpass filters connected to the outputs of said first and second mixers, respectively;

and means for adding the outputs of said first and second filters.

3,967,245

TRAFFIC SIGNAL CONTROL DEVICE WITH CORE MEMORY

Akira Muramatu, Kyoto, and Kiyoshi Kawata, Kameoka, both of Japan, assignors to Omron Tateisi Electronics Co., Japan

Continuation-in-part of Ser. No. 121,891, March 8, 1971, abandoned. This application Sept. 14, 1973, Ser. No. 397,592

Claims priority, application Japan, Mar. 6, 1970, 45-19503

Int. Cl.[2] G06F *15/06, 15/48*

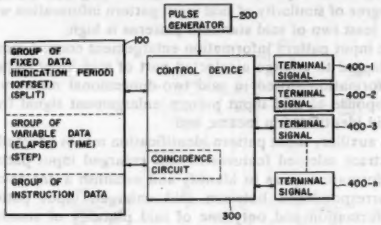
U.S. Cl. 340—172.5 **11 Claims**

1. A traffic signal control device comprising:

a core memory having memory areas for storing digital data in the form of variable data representative of information corresponding to traffic phases and elapsed times, fixed data representative of information corresponding to interval sequences, and instruction data, for controlling traffic signals;

first means, coupled with said core memory, for writing into and reading out from said core memory said digital data;

control means, responsive to said digital data within said memory, for comparing variable data with fixed data and for incrementing the variable data from said memory by a predetermined number upon coincidence of the compared data and for generating first control signals as a result of the coincidence for controlling the traffic signals, said control means including clock pulse generator means for generating clock pulses and command register means, said first means and said command register means being responsive to said clock pulse generating means for reading out instruction data from said core memory and for storing the read out instruction data in the command register means in accordance with the generation of clock pulses; and



a program control circuit, coupled with said control means including said command register means, for controlling time occurrence of the operation of said control means in accordance with the instruction data stored in said command register means.

3,967,246

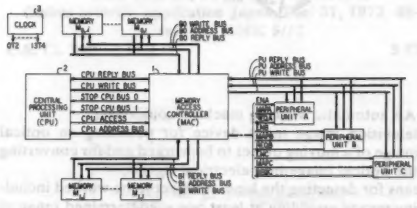
DIGITAL COMPUTER ARRANGEMENT FOR COMMUNICATING DATA VIA DATA BUSES

Frederick Glenn House, Downers Grove, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 5, 1974, Ser. No. 476,436

Int. Cl.[2] G06F *9/18*

U.S. Cl. 340—172.5 **3 Claims**



1. In a memory access controller for use in a data processing system having a plurality of memories, a processor, and a plurality of peripheral units competing with said processor for access to said memories, said memory access controller having means for repetitively receiving sets of memory access requests from said units, the improvement comprising:

a first priority circuit responsive to the receipt of a set of access requests from said units for producing an output identifying a first one of said units having the highest priority request in said request set;

a second priority circuit responsive to the receipt of said request set for producing an output identifying a second

one of said units having the highest priority requests in said request set;

means responsive to the outputs produced by said first priority circuit and said second priority circuit for comparing said outputs to determine if said first priority circuit and said second priority circuit identify the same one of said units;

means cooperating with said comparing means for storing the output of said second priority circuit when said first and said second priority circuits identify the same one of said units;

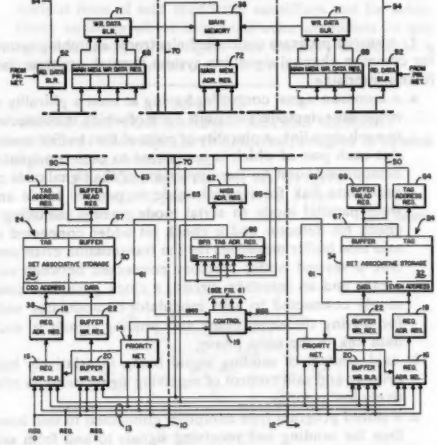
means controlled by said storing means for blocking subsequent access requests generated by the unit identified by an output stored in said storing means from reaching said second priority circuit; and

means cooperating with said comparing means for enabling the unit identified by said second priority circuit to generate an address code if said first and second priority circuits identify the same one of said units.

3,967,247
STORAGE INTERFACE UNIT

Vernon K. Andersen, New Brighton, and Michael W. Goddard, Roseville, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 11, 1974, Ser. No. 522,553
Int. Cl.² G06F *13/00*; G11C *9/06*
U.S. Cl. 340—172.5 **2 Claims**



1. In a digital computing system of the type including a relatively large capacity, high cycle time main memory for storing plural blocks of information, a small capacity, high speed buffer memory for storing subsets of said blocks of information contained in said main memory at addressable locations therein, a plurality of requestor units for addressing information stored in said buffer memory, a tag storage device for storing the addresses of those blocks of information stored in said main memory which are currently contained in said high speed buffer memory as well as age bits indicative of the relative order in which said blocks of information contained in said high speed buffer memory had been addressed by said requestor units, the combination comprising:

a. a plurality of comparator networks having first and second inputs and an output said comparators indicating whether the number represented by the binary digits applied to said first input are greater than, equal to or less than the number represented by the binary digits applied to said second input;

b. means for applying the age bits associated with predetermined blocks of information in said buffer memory individually to said first inputs of said plurality of comparator networks;

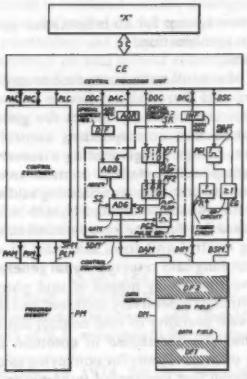
c. means for applying the age bits associated with the block of information in said buffer memory currently being addressed by one of said requestor units to said second inputs of all of said comparator networks; and

d. adder means connected to the outputs of said comparator networks for adding 0, clearing or adding 1, to the age bits of the predetermined blocks which were applied to said first inputs of said comparator networks when the number represented by the age bits applied to said first inputs are greater than, equal to or less than the number represented by the age bits applied to said second inputs, respectively whereby, in dependence upon the new age bits of the blocks, a decision may be made as to replacement of a block based on relative usage of the block.

3,967,248
ARRANGEMENT FOR DOUBLE-WRITING INTO A MEMORY DURING DATA FIELD RELOCATION

Hans Ole Kjöller, Vasterhaninge, and Erik Ivar Sjöquist, Farsta, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Nov. 29, 1974, Ser. No. 528,137
Claims priority, application Sweden, Dec. 13, 1973, 7316837
Int. Cl.² G06F *13/00*
U.S. Cl. 340—172.5 **3 Claims**



1. In a real-time computer, which, while in operation, performs the relocation of data in a memory from a first to a second memory field wherein the memory has means activated by a write pulse for writing data into a memory position defined by received address information, apparatus for writing identical data, stored in a data register, into both of said first and second memory fields during said relocation, said apparatus comprising: a first address register for storing a primary address belonging to said first memory field; a second address register for storing the address separation between said first and second memory fields; and a control circuit comprising an adder means provided with a first input connected to said first address register and a second input connected to said second address register, said adder means having means for producing a result address by adding said address separation to said primary address, a gate device having a first input for receiv-

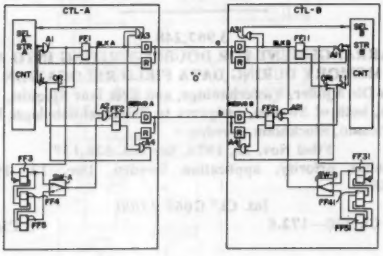
ing said result address, a second input connected to said first address register and an output connected to said memory, a recording means for storing a relocation indication, and control means for controlling the transfer in a determined order of said primary address and said result address from said gate device to said memory, said control means including means for supplying to the memory an additional write pulse when said indication is present.

3,967,249

PRIORITY SELECTION SYSTEM IN ACCESS CONTROL

Yukio Taniyama; Tetsuo Isaka, both of Yokohama; Tetsuo Nagahori, Kawasaki, and Kaoru Kanda, Yokohama, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Filed Dec. 30, 1974, Ser. No. 537,450
Claims priority, application Japan, Dec. 28, 1973, 49-317
Int. Cl.² G06F *3/04*
U.S. Cl. 340—172.5 6 Claims



1. A selection system for an information processing system comprising in combination:

a shared unit;

a plurality of control units connected to said shared unit, for accessing said shared unit, wherein each of said plurality of control units includes means for generating a block signal when that corresponding control unit starts its operation, means for generating a reserved signal when said corresponding started control unit completes its operation and commences accessing said shared unit, and a time delay means connected to said block signal generating means for defining an operation time of said corresponding control unit from said start to said completion and controlling said reserved signal generating means, the respective time delay means of said plurality of control units defining respectively different operations times for each of said plurality of said control units;

a first signal line connected in common to each of said plurality of control units for conveying said block signals;

a second signal line connected in common to each of said plurality of control units for conveying said reserved signals;

each control unit, further including first transmitting means for transmitting a block signal generated by its corresponding block signal generating means, when said control unit has started its operation, over said first signal line to all other said control units, and first receiving means for receiving said transmitted block signals conveyed on said first signal line and preventing said corresponding control unit from subsequently starting its respective operation;

each control unit also includes second transmitting means for transmitting a reserved signal generated by its corresponding reserved signal generating means, when said control unit has completed its operation, over said second signal line to all other said control units, and second receiver means for receiving said transmitted reserved signals conveyed on said second signal line and preventing said corresponding control unit from completing its operation;

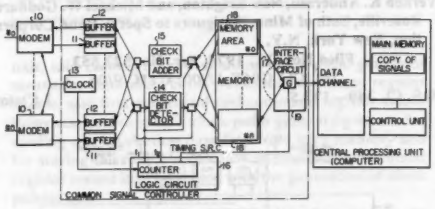
said selection system is characterized by the control unit having the shortest said operation time, of said plurality of control units which have been started, being the first to transmit a reserved signal, thereby preventing all others of said plurality of control units from completing their corresponding operations.

3,967,250

CONTROL SYSTEM OF AN ELECTRONIC EXCHANGE

Yasuhiro Senda, Machida, and Sumitoshi Ando, Tokyo, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 368,830, May 16, 1973, abandoned. This application Feb. 6, 1975, Ser. No. 547,580
Claims priority, application Japan, May 22, 1972, 47-50523
Int. Cl.² G06F *3/00*; H04M *3/00*
U.S. Cl. 340—172.5 3 Claims



1. A stored program controlled electronic switching system for common channel signalling system through separate data links comprising:

a. a common signal controller having at least a plurality of modulator-demodulator units each of which is connected to each data link, a plurality of pairs of first buffer memories each pair of which is connected to each modulator-demodulator unit for the conversion of the signal code on each data link from serial mode to parallel mode and from parallel mode to serial mode, means including a check bit detector and a check bit adder connected to said first buffer memories for the transmission error control, a second buffer memory connected between said means and an interface circuit, a clock generator commonly connected to said modulator-demodulator units for driving the same clock and sending signals in each data link in the same phase;

b. said control of sending signal being in relatively high priority and said control of receiving signal being in relatively low priority;

c. a stored program type computer connected to said interface for sending and receiving signals to and from said data links through said second buffer memory, processing the jobs including storing of the copy of the transmitted signals and re-transmitting it on request.

3,967,251

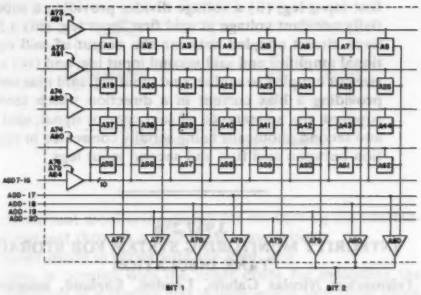
USER VARIABLE COMPUTER MEMORY MODULE

Leonard Levine, Rancho Palos Verdes, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 17, 1975, Ser. No. 569,050
Int. Cl.² G06F *13/08*
U.S. Cl. 340—172.5 9 Claims

1. In a digital computer comprising a central processing unit (CPU) and memory connected by backplane wiring, a memory module which can be reconfigured for various memory size and word length applications by rewiring said backplane, comprising:

addressable memory devices arranged in rows and columns,
address line amplifiers for receiving addressing information from said CPU and for driving the address input lines of said memory devices,
a pulse driver coupled to said CPU for each row of memory devices for enabling said row of memory devices to store or output signal information bits,
a read/write amplifier for each column of memory devices for coupling one bit of information between said CPU and said memory devices in each column,

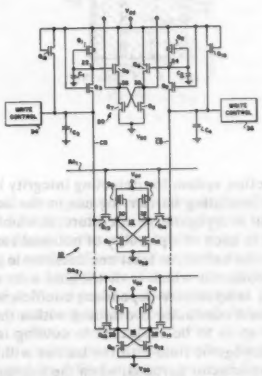


a printed circuit board for mounting said memory devices, said address line amplifiers, said pulse drivers and said read/write amplifiers, and
wherein said backplane wiring is individually coupled to each of said read/write amplifiers for ORing the input-/output lines of said read/write amplifiers and for selectively enabling all of said read/write amplifiers or any subset thereof, to configure said memory module to a particular memory size and word length.

3,967,252
SENSE AMP FOR RANDOM ACCESS MEMORY

Robert Murray Donnelly, Carrollton, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Oct. 3, 1974, Ser. No. 511,572
Int. Cl.² G11C *7/06, 11/24, 11/40*
U.S. Cl. 340—173 R **15 Claims**

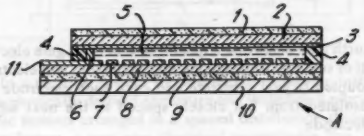


14. The method for reading data from a static memory cell of an integrated circuit memory having a d.c. current path from a sense bus to a source supply voltage means when addressed representing one logic state which comprises
precharging the sense bus to a predetermined voltage level, then
addressing the memory cell to initiate the d.c. current path, and
detecting the current flow through the sense bus before the voltage of the sense bus has been substantially reduced and supplying additional current to the sense bus to prevent excessive discharge of the bus.

3,967,253
DISPLAY DEVICE

Yuki Tsuruishi, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Oct. 29, 1974, Ser. No. 518,906
Claims priority, application Japan, Oct. 29, 1973, 48-121517
Int. Cl.² G11C *11/42*
U.S. Cl. 340—173 LM **20 Claims**



1. A display device comprising a first substrate; a second substrate positioned in spaced relation to said first substrate; a first electrode mounted on said first substrate facing said second substrate; at least one second electrode mounted on said second substrate facing said first electrode; a display material disposed between said substrates and electrodes and adapted so that the region thereof in registration with at least the second electrode is rendered visually distinguishable from the adjoining regions of said material upon the selective energization of said electrodes; and at least one display cell driving circuit means mounted on said second substrate in the region of each of said second electrodes, each of said display cell driving circuit means including at least one radiation detecting means for detecting selectively applied radiation from outside of said display device and at least one shift register stage means coupled to said radiation detecting means for storing a data state representative of the detection of radiation by said radiation detecting means and coupled to the associated second electrode for energizing said electrodes in response to said detection of radiation by said radiation detecting means.

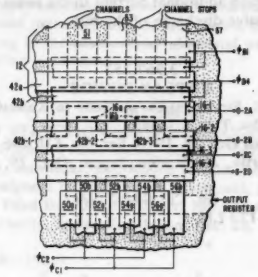
3,967,254
CHARGE TRANSFER MEMORY

Walter Frank Kosonocky, Skillman, and Donald Jon Sauer, Plainsboro, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,830
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **5 Claims**

1. A charge-coupled device structure comprising in combination:
a semiconductor substrate formed with a plurality of channels along which charge may be propagated, said channels extending in the column direction;
a storage electrode extending in the row direction with fingers over alternate of said channels extending in the column direction;
a first gate electrode extending in the row direction adjacent to said storage electrode and lying over said fingers;
a second gate electrode extending in the row direction, adjacent to said first gate electrode and lying over the ends of said fingers;
a third gate electrode extending in the row direction, adjacent to said second gate electrode, said third gate electrode formed with fingers extending in the column direction over the remaining alternate channels, interleaving

with the fingers of the storage electrode, passing beneath said second gate electrode and with the ends of said fingers extending to beneath said first electrode; and



a fourth gate electrode adjacent to said third gate electrode, all of said electrodes being insulated from and electrically coupled to said substrate and each such electrode being insulated from but closely spaced to the next adjacent electrode.

3,967,255

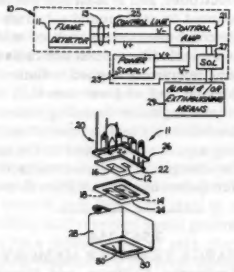
FLAME DETECTION SYSTEM

Stuart M. Oliver, Los Angeles; Ralph A. Proud, Jr., Pasadena, and Sanford J. Parsons, Richmond, all of Calif., assignors to The Delphian Foundation, Sheridan, Oreg. and Q² Corporation, Los Angeles, Calif., a part interest to each

Filed June 28, 1974, Ser. No. 484,283

Int. Cl.² G08B 21/00

U.S. Cl. 340—227 R **20 Claims**



18. In an electrically-powered flame detection system, a flame detector comprising:

a. a first combination of a first photocell and a first light filter mounted in planar juxtaposition within a housing, said first combination having a spectral response in a first region of the light spectrum, said first region being that portion of the spectrum wherein the spectral energy from a hydrocarbon flame is relatively sparse;

b. a second combination of a second photocell and a second light filter mounted in a planar juxtaposition within said housing, said second combination having a spectral response in a second region of the light spectrum, said second region being that portion of the spectrum wherein the spectral energy from a hydrocarbon flame is relatively abundant;

c. a binary high-speed switching circuit having an input and an output, said first and second photocells being electrically coupled to said input in opposing direction, said sensing amplifier being arranged and configured to provide a control signal at its output only when said second photocell generates an electrical signal which is substantially greater than that generated by said first photocell, whereby, said flame detector discriminates a hydrocarbon flame within the range and field view of said photocells from other common sources of illumination and said sensing amplifier provides said control signal in response thereto, said switching circuit being comprised of (i) an operational amplifier having first and second input legs, said operational amplifier being arranged and configured to provide said control signal at said output when the voltage at said second input leg is greater than that at said first input leg; (ii) a voltage divider providing a substantially constant voltage at said first input leg; (iii) a feedback circuit coupled between the output of said operational amplifier and said second input leg; and (iv) a bias resistor coupled to said second input leg, said bias resistor providing a bias current in a direction which tends to suppress the appearance of said control signal, said first and second photocells being serially connected in opposition between said first and second input legs.

3,967,256

INTEGRITY MONITORING SYSTEM FOR STORAGE TANK INSULATION

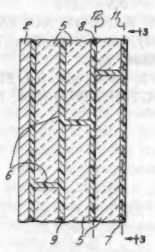
Telemachus Nicolas Galatis, London, England, assignor to Marine and Industrial Developments Limited, Piraeus, Greece

Filed Apr. 24, 1974, Ser. No. 463,783

Claims priority, application United Kingdom, Apr. 26, 1973, 19951/73

Int. Cl.² G08B 21/00

U.S. Cl. 340—242 **7 Claims**

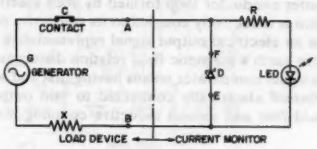


1. A detection system for detecting integrity impairment of a thermally insulating barrier for use in the containment of fluid material at cryogenic temperature, in which system there is provided, in each of a plurality of notional zones within the area of the said barrier, at least one detector in the form of an electrical conductor which is distributed over said zone and which has a temperature-dependent coefficient of electrical resistance; said conductor is disposed within the thickness of said barrier so as to be subjected to cooling in the event of leakage of cryogenic fluid into the barrier within the zone to which that conductor pertains, when the barrier is in use; and the said conductors distributed over the different notional zones are electrically connected to a voltage source and to different warning devices each actuatable in dependence on a lowering of the temperature and consequent change in the electrical conductivity of the associated one of said conductors.

3,967,257
CURRENT MONITOR CIRCUITS

Robert E. Hager, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 322,238, Jan. 9, 1973, abandoned. This application Jan. 7, 1975, Ser. No. 539,145
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—253 R 7 Claims

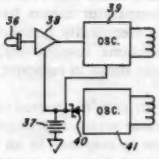


1. A current monitoring circuit for monitoring the continuity of current through a load device comprising:
a zener diode in series with the load; and
means in parallel with the zener diode for indicating the presence of a reverse bias voltage across said zener diode which is greater or equal to the minimum voltage across said means when said means is conducting current, the minimum voltage across the means being less than the breakdown voltage of said zener diode.

3,967,258
ALARM SYSTEM

J. Fred Bucy, Jr., Dallas, Tex., assignor to Texas Instruments, Dallas, Tex.

Filed Aug. 6, 1973, Ser. No. 386,134
Int. Cl.[2] G08B 13/18
U.S. Cl. 340—258 B 8 Claims

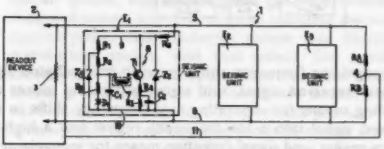


1. A surveillance system comprising a plurality of pairs of emitters and detectors with each pair being effective to detect breaking of a beam between the emitter and detectors, each emitter being a small self-powered unit which may be installed on site without wiring connections, each emitter consisting essentially of a battery and a semiconductor GaAs radiant diode device producing infrared light, each detector including a solid state radiation-responsive device and a battery and transmitting a continuous wireless radio frequency signal which is altered in a first manner to a set frequency upon interruption of the beam, each detector including means for producing a radio frequency signal different from said set frequency when the voltage of its battery is low, a central control console including a receiver responsive to change in any of said signals from the detectors and adapted to produce an alarm or indication when any of said signals is altered.

3,967,259
SECURITY SYSTEM WITH PLURAL SENSORS CONNECTED IN PARALLEL ACROSS THE TRANSMISSION LINE

Daniel Marie Pierre Lecuyer, Le Pecq, France, assignor to La Detection Electronique Francaise Protechat, Vanves, France

Continuation of Ser. No. 240,720, April 3, 1972, abandoned. This application Dec. 17, 1973, Ser. No. 425,659
Claims priority, application France, Apr. 7, 1971, 71.12290
Int. Cl.[2] G08B 13/00
U.S. Cl. 340—258 D 5 Claims



1. In a security system for seismically detecting intrusions into a physically defined enclosure and including a plurality of seismic sensors arranged in a spaced distribution throughout the enclosure, a two wire electrical transmission line, means individually connecting each sensor in parallel across the two wires of the transmission line, and a readout device connected to one end of the transmission line, the improvements characterized by:
a. the connecting means each including an amplifier having its input connected to a sensor and its output connected to the transmission line, whereby each sensor is always active and on-line, each amplifier having a high output impedance with respect to the impedance of the transmission line whereby each sensor and amplifier combination has a negligible influence on the impedance of the transmission line and does not provide any substantial attenuating shunt path for the signals from the other sensor and amplifier combinations,
b. readout impedance means connected across said one end of the transmission line, the value of said impedance means being equal to the characteristic impedance of the transmission line at the seismic frequency range within which the system operates to thereby avoid any signal reflections,
c. two resistors connected in series across the other end of the transmission line, the value of the resistors being high relative to the characteristic impedance of the transmission line whereby the resistors do not provide any substantial attenuating shunt path for the signals from the sensor and amplifier combinations, and
d. means connecting a junction point between the resistors to the readout device to thereby implement the monitoring of the transmission line for grounding, shorting and cutting.

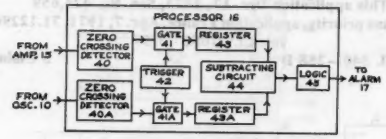
3,967,260
INTRUSION ALARM SYSTEM WITH IMPROVED AIR TURBULENCE COMPENSATION

Donald P. Massa, Cohasset, Mass., assignor to Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees of the Stoneleigh Trust u/d/t Dec. 4, 1973, Cohasset, Mass.

Filed July 8, 1974, Ser. No. 486,673
Int. Cl.[2] G08B 13/16
U.S. Cl. 340—258 A 10 Claims

1. In an intrusion alarm system, means for radiating a signal at a predetermined frequency into a space, means for receiving the signal as it is reflected from objects within the space, the received signal having a frequency differing from that of the radiated signal by amounts corresponding to the rates of movement of said objects, the received signal also having amplitude modulations caused by phenomena other than

moving objects, signal processing means for processing said received signal, said signal processing means including means for first effectively eliminating amplitude modulations in the received signal, said means for eliminating amplitude modulations in the received signal includes a zero crossing detector, said signal processing means also including additional means



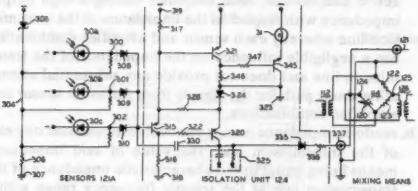
for recognizing frequency shifts between said radiated signal and said received signal, said signal processing means also including means for separating said frequency shifts in said received signal into a low-frequency region and a high-frequency region, and signal detection means for recognizing the presence of a signal when it appears in said high-frequency region.

3,967,261

PROXIMITY SENSOR WITH SIMULTANEOUSLY ACTIVE INTERMIXED SENSOR TYPES

Solly L. Fudaley, 12437 S. 80th Ave., Palos Park, Ill. 60604

Filed Oct. 10, 1974, Ser. No. 513,521
Int. Cl.² G08B *13/18*
U.S. Cl. 340—258 C **10 Claims**



1. A proximity sensor comprising an intermixed plurality of different types of simultaneously operating sensing devices including at least an RF antenna and connected in parallel with at least one off/on switching sensors means for simultaneously mixing the outputs from each of the various types of said parallel connected sensing devices, and detector means including a common circuit operated responsive to the output of said mixing means for giving an alarm signal responsive to a change in an output signal from any one of said sensing devices.

3,967,262

LINE INTEGRATED COMBINATION MAGNETIC AND STRAIN LINE SENSOR

Herbert A. Reich, Alexandria, and Jack K. Maier, Fairfax Station, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

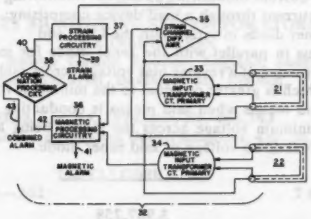
Filed Apr. 30, 1975, Ser. No. 573,286
Int. Cl.² G08B *13/22, 13/02*
U.S. Cl. 340—258 R **4 Claims**

1. A line integrated combination magnetic and strain line sensor for indicating an intrusion into the area being monitored by said sensor comprising:

first and second U shaped sensors, each of said sensors having two elongated leg sections and a bottom section with said leg sections of each sensor disposed in substantially the same plane, said sensors being juxtaposed such that one leg section of said first sensor is disposed in close proximity to one leg section of said second sensor, each of said first and second sensors consisting of a coaxial cable with center and outer conductors and a selected dielectric therebetween, each of said sensors being electrically open ended at both ends;

first and second inductive coupling means each including input means and output means, each of said input means of said first and second coupling means electrically connected across the outer conductors of the ends of its respective coaxial sensor such that any current flow in the outer conductor loop formed by such electrical connection is inductively coupled to its respective output means as an electrical output signal representative of a respective earth's magnetic field relation disturbance;

first signal comparator means having first and second inputs thereof electrically connected to said output means of said first and second inductive coupling means, respectively, and adapted to produce an output signal in response to input signal differences;



first and second electrical shunt means electrically connected across the inner conductors of the ends of its respective coaxial sensor such that said inner conductors of said first and second sensors form first and second loop sections adapted to produce an electrical signal representative of ambient strain disturbances;

second signal comparator means having first and second inputs thereof electrically connected to said first and second loop sections, respectively, and adapted to produce and output signal in response to input signal differences; and

alarm means electrically connected to said first and second signal comparator means and adapted to provide an area intrusion alarm in response to an output signal from at least one of said first and second signal comparator means.

3,967,263

TEXT EDITING SYSTEM

Hsu Chang, Yorktown Heights, and Share-Young Lee, Lake Mohegan, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

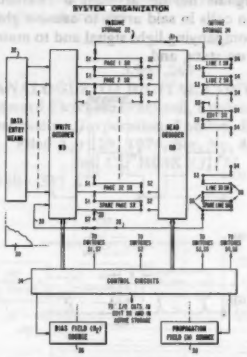
Filed May 14, 1974, Ser. No. 469,927
Int. Cl.² G06F *15/40*; G11C *19/08*
U.S. Cl. 340—172.5 **26 Claims**

1. An apparatus for data manipulation, comprising:

a plurality of dynamic shift registers in which said data can be stored,

switch means for controllably connecting said shift registers in series for sequential access of data in said shift registers, said series connected registers having no bit position through which said data passes twice as it moves entirely through said series connection of registers, and

switch means for controllably disconnecting said shift registers from one another and for making said shift registers



closed loop shift registers having no common bit positions.

3,967,264

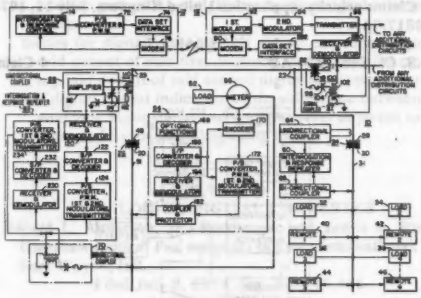
DISTRIBUTION NETWORK POWER LINE COMMUNICATION SYSTEM INCLUDING ADDRESSABLE INTERROGATION AND RESPONSE REPEATER

Ian A. Whyte, Pittsburgh; Louis G. Ottobre, Murrysville, and James P. McGivern, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 31, 1975, Ser. No. 546,069

Int. Cl.² H04M *11/04*

U.S. Cl. 340—310 A **63 Claims**



25. A power line communication system comprising:

first power line conductor means,

second power line conductor means,

distribution transformer means interconnecting said first and second power line conductor means,

electrical loads connected to said second power line conductor means,

uniquely addressable repeater means associated with certain of said distribution transformer means,

uniquely addressable remote communication terminals associated with certain of said electrical loads,

a source of interrogation signals which provides an interrogation signal having an address of a selected repeater means and the address of a selected remote communication terminal,

response receiving means,

means providing an interrogation communication link between said source of interrogation signals and said remote communication terminals, including said first power line conductor means, unidirectional coupling means coupling said first power line conductor means to said repeater means, bidirectional coupling means coupling said repeater means to said second power line conductor means, and means coupling each remote communication terminal to said second power line conductor means,

means providing a response communication link between said remote communication terminal and said response receiving means, including said second power line conductor means, said bidirectional coupling means, said repeater means, said bidirectional coupling means, said second power line conductor means, said distribution transformer means, said first power line conductor means, and means coupling said response receiving means to said first power line conductor means, whereby each remote communication terminal provides a response signal for said response receiving means when it is addressed by an addressed repeater means, with the interrogation communication link by-passing said distribution transformer means while the response communication link utilizes said distribution transformer means.

3,967,265

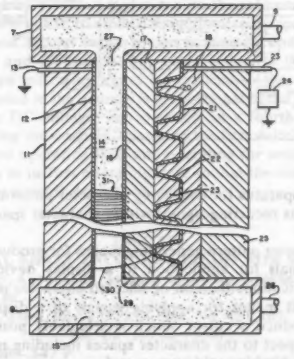
LIGHT GATING DISPLAY

Carlyle W. Jacob, 118 President Lane, Quincy, Mass. 02169

Continuation-in-part of Ser. No. 168,048, Aug. 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 724,661, March 18, 1968, abandoned, which is a continuation-in-part of Ser. No. 383,471, July 17, 1964. This application Dec. 26, 1973, Ser. No. 428,425

Int. Cl.² G08B *5/36*

U.S. Cl. 340—324 R **66 Claims**



1. A light reflective display system comprising:

a liquid suspension of fine, electric field responsive, light gating particles;

a panel adapted to having its front viewing surface illuminated, the panel including a suspension chamber formed between a transparent front wall and a rear wall that is closely spaced from the front wall, the front wall including a transparent, electrically conductive layer, the suspension chamber having an inlet duct supply means and an outlet duct exhaust means arranged to permit the suspension of light gating particles to flow through the chamber as a thin, broad, smooth ribbon;

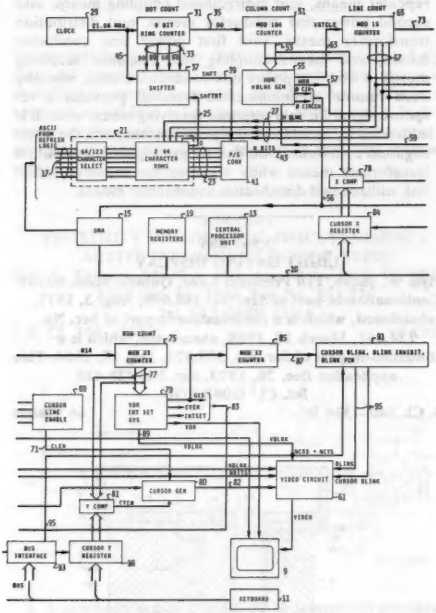
means for applying a pattern of electric potentials to the rear wall of the suspension chamber to thereby produce an electric field pattern within the suspension chamber;

and means to cause the suspension of fine particles to flow through the suspension chamber as a thin broad smooth ribbon.

3,967,266
DISPLAY APPARATUS HAVING IMPROVED CURSOR ENHANCEMENT

Jean Claude Roy, Sunnyvale, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sept. 16, 1974, Ser. No. 506,389
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 AD **5 Claims**



1. Apparatus for displaying character patterns on a display device as recurring signals within character spaces, and comprising:

character pattern generating means for producing recurring signals for application to a display device to provide indications thereon of selected character patterns;

circuit means for applying signals to a display device to produce a cursor which is selectably positionable with respect to the character spaces including means for visibly blinking said cursor; and

means coupled to the circuit means and responsive to variations in time in the position of the cursor for disabling said blinking means to display a non-blinking cursor during movement of the cursor through a displayed character pattern.

3,967,267
LIGHT PEN DETECTION FOR PLASMA PANELS USING SPECIALLY TIMED SCANNING ADDRESS PULSES

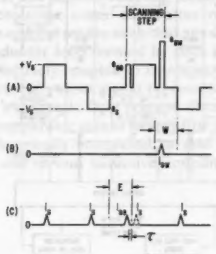
Peter Dinh-Tuan Ngo, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 9, 1974, Ser. No. 513,475
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 M **17 Claims**

1. A display system comprising

an array of plasma discharge display cells having inherent memory,

means for applying alternating polarity sustain signals to all of said cells in said array, said sustain signals adding to memory signals having at least a characteristic level stored in on cells in said array to cause a glow discharge and an accompanying light signal and to maintain said on cells in an on state, and



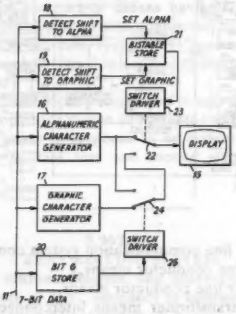
means operative after the initiation of ones of said sustain signals for applying first flashing signals to selected cells in said array,

said means for applying first flashing signals comprising means for generating signals each having a magnitude sufficient to cause a glow discharge at an off cell but having an insufficient duration with respect to its initiation point to store a signal in said selected off cells corresponding to said characteristic level, each of said first flashing signals having the same polarity as the sustain signal initiated immediately before it.

3,967,268
DATA DISPLAY SYSTEMS

Allan Roberts, Sutton, England, assignor to British Broadcasting Corporation, London, England

Filed June 30, 1975, Ser. No. 591,876
Claims priority, application United Kingdom, July 11, 1974, 30817/74
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 AD **4 Claims**



1. A data display system comprising a display device arranged to display characters as selected dots of dot matrices, decoding means responsive to character codes to control the display device to display alphanumeric characters in selected cells of an array of character cells and graphic characters in other selected cells, the decoding means being responsive to the alphanumeric character codes, including control codes, to switch between alphanumeric and graphic modes in dependence upon the control codes and, in the alphanumeric mode, to control the display of the alphanumeric characters in accor-

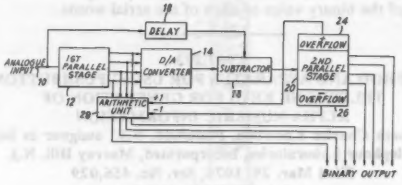
dance with the alphanumeric codes other than the control codes, the decoding means being further responsive in the graphic mode to a first restricted set of the codes to control the display of the graphic characters and to a second restricted set of the codes to control the display of a restricted set of the alphanumerical characters.

3,967,269

ANALOGUE TO DIGITAL CONVERTERS

Russell Edward Fletcher, Bracknell, England, assignor to British Broadcasting Corporation, London, England

Filed Apr. 29, 1974, Ser. No. 464,975
Int. Cl.² H03K 13/175
U.S. Cl. 340—347 AD **3 Claims**



1. An analogue-to-digital converter comprising:

first digitising means for relating an analogue input signal to one of a plurality of coarse amplitude ranges and providing a digital output indicative of the coarse range into which said input signal falls;

subtractive means for determining the difference between said analogue input signal and the coarse level corresponding to said coarse range into which said input signal falls and providing an output in response thereto;

second digitising means for providing a digital output indicative of said difference;

means for detecting whenever said output of said subtractive means exceeds a range defined by said coarse range and for generating a digital correction signal in response thereto; and

means for digitally adding said digital correction signal to said output of said first digitising means, and for modifying said output of said second digitising means to provide a digital output indicative of the difference between said analogue input signal and a coarse level adjacent to that indicated by said first digitising means.

3,967,270

ANALOG-TO-DIGITAL CONVERTER

Robert L. Anderson, Jr., Pittsburgh, and James B. Russell, Glenshaw, both of Pa., assignors to Essex International, Inc., Fort Wayne, Ind.

Filed July 8, 1974, Ser. No. 486,446
Int. Cl.² H03K 13/20
U.S. Cl. 340—347 NT **6 Claims**

1. A system for converting the magnitude of a DC voltage having predetermined polarity into a plurality of signals representing a corresponding digital number comprising:

an input terminal for receiving the DC voltage;

a current sink having neutral polarity and neutral voltage;

a source of a reference voltage having the predetermined polarity;

an integrating circuit having an inverting input, a non-inverting input, and an output for producing an output signal;

comparator means for producing an indicating signal in response to a predetermined relationship between the output signal and the reference voltage;

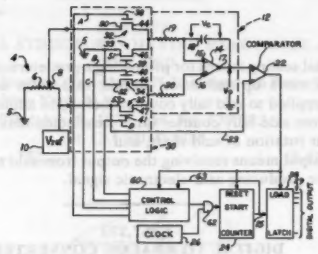
a digital counter resettable in response to the indicating signal;

clock means for generating clock pulses;

first switch means for operatively connecting the DC voltage to the inverting input during a first operating state, for operatively connecting the current sink to the inverting input during a second operating state and for disconnecting the DC voltage and the current sink from the inverting input during a third operating state;

second switch means for operatively connecting the non-inverting input to the current sink during a first operating state and for operatively connecting the reference voltage to the non-inverting input during a second operating state; and

control means operable in the first mode for simultaneously operating the first and the second switch means in their first operating states and for transmitting clock pulses to the counter until the counter achieves a predetermined



count so that the output signal attains a first voltage, operable in a second mode in response to the predetermined count for simultaneously operating the first switch means in its third operating state and the second switch means in its second operating state so that the output signal attains a second voltage different from the first voltage by a value proportional to the reference voltage, operable in a third mode for simultaneously operating the first and second switch means in their second operating states and for transmitting clock pulses to the counter until an indicating signal is produced so that the count registered in the counter is proportional to the magnitude of the DC voltage, and operable in a fourth mode for resetting the counter, operating the first switch means in its third operating state and operating the second switch means in its first operating state so that the output signal returns toward the neutral voltage.

3,967,271

DIGITAL SHAFT ENCODER CIRCUIT FOR SCALES

Earl G. Day, Aurora, Ill., assignor to Barber-Greene Company, Aurora, Ill.

Filed July 23, 1974, Ser. No. 491,101
Int. Cl.² H03K 13/00
U.S. Cl. 340—347 P **16 Claims**

1. A circuit for converting angular rotation of a mechanical shaft to which an optical shaft encoder is coupled into an electronic signal representative of the amount and direction of said rotation comprising:

a. delay means receiving electrical pulses from said encoder for generating timing pulses on the transitions of said encoder pulses, said delay means including:

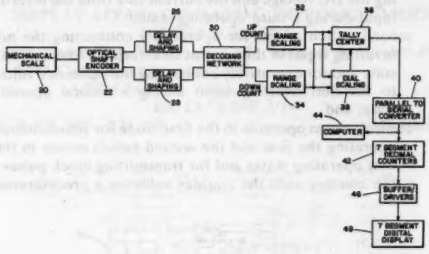
i. circuit means for generating a spike waveform on the leading and trailing edges of said encoder pulses; and

ii. logic means for shaping said spike waveforms and providing a selected delay to thereby produce said timing pulses;

b. decoding means receiving said timing pulses and the encoder pulses for producing an up count representative of rotation in a first direction and a down count representative of shaft rotation in the opposite direction;

c. range scaling means for scaling the up and down counts from said decoding means to accommodate a selected maximum value;

d. a tally counter for counting the scaled up and down counts;



e. dial scaling means for producing a predetermined number of extra up and down counts, said extra counts being supplied to said tally counter thereby to adjust the output from said tally counter for a preselected maximum angular rotation of said shaft; and

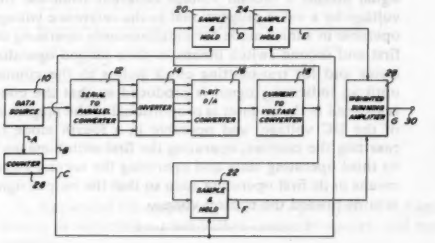
f. output means receiving the output from said tally counter for producing said electronic signal.

3,967,272

DIGITAL TO ANALOG CONVERTER

Wayne H. Sandford, Jr., Warrington, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1975, Ser. No. 572,472
Int. Cl.² H03K *13/02*
U.S. Cl. 340—347 DA **6 Claims**



1. A digital to analog converter having a digital data source for producing a series of 2n-bit serial words at a first output and a bit synchronized pulse train at a second output, comprising, in combination:

conversion means adapted to receive the data source first output for sequentially converting the 2n-bit serial words into first and second parallel n-bit outputs;

an n-bit digital to analog converter operatively connected to receive said conversion means outputs for converting respective ones of said outputs to corresponding analog signals;

counting means adapted to receive the data source second output for periodically producing a first output signal during the nth bit interval of each of said 2n-bit words and a second output signal during the 2nth bit interval of each of said 2n-bit words;

first sample and hold means operatively connected to receive said converter output signals and said counting means first output signal for sampling said analog signals during the nth bit interval of each of said 2n-bit words and for storing an analog output representative thereof;

second sample and hold means operatively connected to receive said converter output signals and said counting means second output signal for sampling said analog signals during the 2nth bit interval of each of said 2n-bit words and for storing an analog output representative thereof;

third sample and hold means connected to receive said first sample and hold means output and said counting means second output signal for sampling said first sample and hold means output during the 2nth bit interval of each of said 2n-bit words and for storing an analog output representative thereof; and

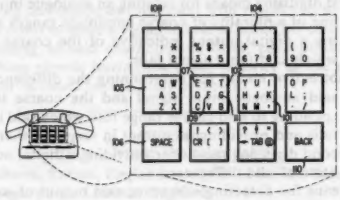
summing means connected to receive said second and third sample and hold means analog outputs for summing said analog outputs according to a predetermined weighted ratio and for producing an analog output signal indicative of the binary value of each of the serial words.

3,967,273

METHOD AND APPARATUS FOR USING PUSHBUTTON TELEPHONE KEYS FOR GENERATION OF ALPHA-NUMERIC INFORMATION

Kenneth Charles Knowlton, Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 29, 1974, Ser. No. 456,029
Int. Cl.² H04L *15/04*
U.S. Cl. 340—365 S **7 Claims**



5. The method of using an input signaling device containing a plurality of buttons arranged in rows and columns each of said buttons labeled with at most nine alpha-numeric characters in a three by three array, comprising the following steps:

pushing a first button containing a desired character in its three by three labeling array; and

thereafter pushing a second button closest to said first button along a vector which originates in the center of said first button along an imaginary line through said character, the second button being identical to the first button if the character lies in the center of the three by three labeling array.

3,967,274

SIGNAL LIGHT

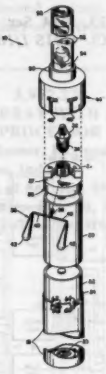
Colvard W. Howell, 829 E. McIntosh, Griffin, Ga. 30223

Filed Oct. 21, 1974, Ser. No. 516,442
Int. Cl.² G08B *5/00*
U.S. Cl. 340—380 **4 Claims**

1. In a signal light device for signaling cocktail waitress, bartender or other person comprising:

a base to be supported on a surface such as a table; a light housing extending upwardly from said base and having electrical battery means therein; an elongated light conducting member mounted on and extending upwardly from said housing for conducting light upwardly therethrough; switch means on said housing comprising a flipswitch operating member movably mounted to be easily shifted, said operating member having a projecting center contact portion and arms extending therefrom on both sides; said housing having a notched out portion in

which said operating member is mounted for partial confinement, a light bulb is in said housing, a conducting collar on said housing in which said light bulb is mounted, said switch contact portion being adjacent said collar for contacting same in one position and for non-contact



therewith in another position, whereby said switch may be moved from a contact position to a non-contact position, and a cap covering said conducting collar, said cap having elongated slots extending upwardly therein in which said switch contact arms are confined for operation therein.

3,967,275

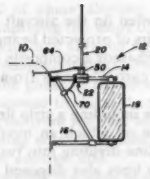
ANTENNA MOUNT FOR VEHICLES

Harold H. Wagman, 370 Lakeview Drive, York, Pa. 17402

Filed Oct. 28, 1975, Ser. No. 626,345

Int. Cl.² H01Q *1/32*

U.S. Cl. 343—713 **8 Claims**



1. A clamp-type mount for supporting the base end of an elongated antenna upon a projecting rod-like member on a vehicle and adapted to support said antenna substantially vertically upon said projecting rod-like member, said mount comprising in combination, a pair of complementary clamping members each having similar clamping surfaces opposing each other, said surfaces each having a groove therein extending between opposite ends thereof and V-shaped in cross-section and adapted to engage respectively opposite surfaces of a rod-like structional member for support thereby, said clamping members having a plurality of aligned holes therein, a plurality of clamping bolts extending through said aligned holes between said clamping members to tightly clamp said members to said rod-like structural member, one of said clamping members also having a seat formed on a surface thereof opposite said groove therein, an antenna coupling member formed from electrical insulating material and having one end in abutment with said seat on said one clamping member, said coupling member having an axial bore therethrough and at least the opposite ends of said bore being threaded, said one clamping member also having a bore extending therethrough between said seat and groove perpendicularly to the axis of said groove, a threaded connector having one end secured within said bore in said one clamping member and projecting beyond said seat and firmly threadably engaging the threads in one end portion only of said coupling member to secure it firmly against said seat, means to connect a ground wire to said one clamping member, and an apertured metallic connector adapted to receive a threaded end of an aerial rod to firmly clamp said metallic connector to said insulating antenna coupling member in spaced relation to the end of said threaded connector therein and securely clamp said apertured metallic connector against the outer end of said insulating antenna coupling member for insulated support thereby upon said one clamping member.

3,967,276

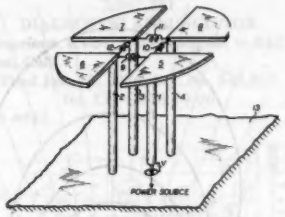
ANTENNA STRUCTURES HAVING REACTANCE AT FREE END

George E. J. Goubau, Eatontown, N.J., assignor to Beam Guidance Inc., New York, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,703

Int. Cl.² H01Q *9/36*

U.S. Cl. 343—752 **18 Claims**



1. In an antenna structure, means serving as a ground plane, a number of elongated conductors having mutual spacings which are small against operating wave length, and positioned substantially perpendicular to said ground plane; some of said conductors at their lower ends being connected to said ground plane while at least one of said conductors is connected to the input terminal of the antenna structure, inductive elements, and separate conductive segments terminating each of said elongated conductors at its upper end, to act as top capacitors against said ground plane, and interconnected by said inductive elements.

3,967,277

RADIO NAVIGATION SYSTEM

Charles E. Hastings, Newport News, and William A. Runion Tabb, both of Va., assignors to Teledyne, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 764,503, Oct. 2, 1968, abandoned, which is a continuation-in-part of Ser. Nos. 713,202, March 14, 1968, abandoned, and Ser. No. 713,442, March 15, 1968, abandoned. This application Dec. 10, 1970, Ser. No. 96,767

Int. Cl.² G01S *1/30*

U.S. Cl. 343—105 R **21 Claims**

1. A radio navigation system for determining the position of a mobile station relative to a plurality of fixed stations, comprising:

a first pair of fixed transmitting stations comprising a base station and a first relay station,

a second pair of fixed transmitting stations comprising said base station and a second relay station,

said base station comprising means for transmitting a continuous wave signal having a first predetermined frequency,

said first relay station comprising a receiver for receiving signals broadcast by said base station, a modulatable transmitter for generating a first carrier signal having a frequency differing from one-half of said first predetermined frequency by an amount equal to one-half of a second predetermined frequency, means for doubling the frequency of said first carrier signal, means for mixing said doubled first carrier signal with the output of said receiver to derive a first modulating signal whose frequency is equal to said second predetermined frequency, and means for applying said first modulating signal to said transmitter, whereby said first relay station transmits said first carrier signal modulated by said first modulating signal,

said second relay station comprising a receiver for receiving signals broadcast by said base station, a modulation transmitter for generating a second carrier signal having a frequency differing from one-half of said first predetermined frequency by an amount equal to one-half of a third predetermined frequency, means for doubling the frequency of said second carrier signal, means for mixing said doubled second carrier signal with the output of said receiver to derive a second modulating signal whose frequency is equal to said third predetermined frequency, and means for applying said second modulating signal to said transmitter, whereby said second relay station transmits said second carrier signal modulated by said second modulating signal,

a mobile station,

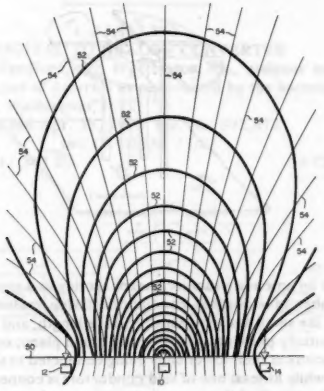
first means located at said mobile station for deriving a first position indicating signal indicative of the difference in the distances between said mobile station and each of said first pair of fixed transmitting stations,

second means located at said mobile station for deriving a second position indicating signal indicative of the difference in the distances between said mobile station and each of said second pair of fixed transmitting stations,

said mobile station including receiving means for receiving the signals transmitted by said transmitting stations and for deriving control signals from the signals so received to control said first means and said second means,

summing means for adding said first and second position indicating signal indicative of a first line of position on which said mobile station is located, and

difference means for subtracting one of said first and second position indicating signals from the other of said first and second position indicating signals to obtain a fourth position indicating signal indicative of a second line of position on which said mobile station is located.

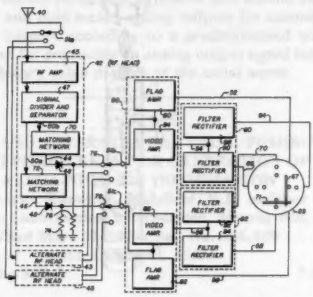


3,967,278

LOW COST MICROWAVE RECEIVER FOR ILS

Walter E. Buehler, Issaquah, and George W. Fitzsimmons, Lynwood, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 23, 1974, Ser. No. 517,193
Int. Cl.[3] G01S 1/16, 1/18
U.S. Cl. 343—108 R **9 Claims**



1. Signal processing apparatus, for use in a microwave-frequency instrument landing system for aircraft or similar maneuverable apparatus, in which system two orthogonal pairs or modulated overlapping beams are projected into space, wherein equal modulation signal levels in the pairs of overlapping beams define a directional axis which is the desired navigational path of the aircraft, one pair of beams having a first carrier signal and so oriented in space as to provide glide slope information of the aircraft relative to the desired navigation path, and the other pair of beams having a second carrier signal and so oriented in space as to provide localizer information of the aircraft relative to the desired navigation path, each carrier signal being modulated by first and second modulating signals of different frequency, the signal processing apparatus comprising:

antenna means mounted on the aircraft for receiving said two orthogonal pairs of projected beams and providing at a common output thereof a composite signal which comprises modulated carrier signals from each of said received beams;

signal splitting means including a strip line circuit having a dielectric substrate on which an input strip line is disposed, said input line dividing into two separate, spaced apart, output strip lines also disposed on said substrate, said input line connected to said common output of said antenna means for receiving said composite signal and said output lines each conducting a separate portion of said composite signal;

a first series of filter means arranged adjacent a first of said output lines for filtering out at least a substantial portion of said first carrier signals from said portion of said composite signal conducted thereby to yield first channel signals on such first output line that are derived substantially from said second carrier signals;

a second series of filter means arranged adjacent a second of said output lines for removing said second carrier signals from said portion of said composite signal conducted thereby to yield second channel signals on such second output line that are derived substantially from said first carrier signals;

means for detecting said first and second channel signals;

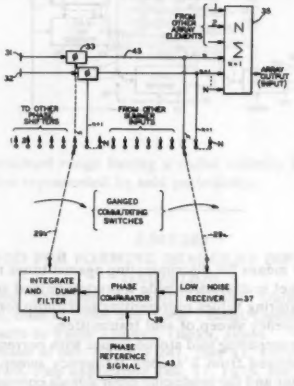
first means for discriminating between modulating frequencies of said detected first channel signals and applying the discriminated signals to a glide slope indicator, any differ-

ence in magnitude between said discriminated signals of said detected first channel signals being indicative of a glide slope offset from the desired navigation path; and, second means for discriminating between modulating frequencies of said detected second channel signals and applying the discriminated signals to a localizer indicator, any difference in magnitude between said discriminated signals of said detected second channel signals being indicative of a localizer offset from the desired navigation path.

3,967,279
SELF-PHASING ARRAY WITH A TIME-SHARED PROCESSOR

Andrew E. Zeger, Wyndmoor, Pa., assignor to The Magnavox Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 95,782, Dec. 7, 1970, abandoned. This application Oct. 30, 1973, Ser. No. 411,103
Int. Cl.² G01S *3/44*; H01Q *3/26*
U.S. Cl. 343—117 A **12 Claims**



4. The method of phase aligning a distributed receiving antenna array comprising the steps of:

summing the individual antenna signals;

comparing the phase of a signal from a selected one of the antennas to the phase of the sum signal;

adjusting, in response to the said comparison, the phase at which the signal from the said selected antenna is added to the remaining antenna signals; electronically stepping a commutator control; and

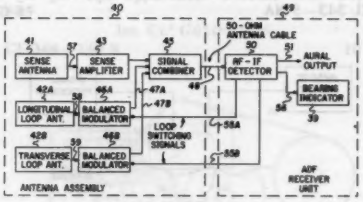
sequentially repeating the steps of comparing and adjusting for different selected antennas.

3,967,280
DIRECTION FINDING SYSTEM WITH INTEGRATED LOOP AND SENSE ANTENNA ASSEMBLY

Abbott F. Mayer, Marion, and David J. Morgan, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 27, 1975, Ser. No. 544,440
Int. Cl.² G01S *3/16*
U.S. Cl. 343—121 **9 Claims**

1. In an automatic direction finding receiver system; an antenna unit integrally including a sense antenna means, a loop antenna means, modulating means to which the output of one of said antenna means is applied, and signal combining means receiving the output of said modulating means and the output of the other of said antenna means; a modulating signal source; a remote receiver unit including signal demodulating means responsive to the output of said signal combining means and the output of said modulating signal source to develop an output signal definitive of the bearing of a received signal; RF cable interconnect means between the output of said signal combining means and said receiver demodulating means with the output impedance of said signal combining

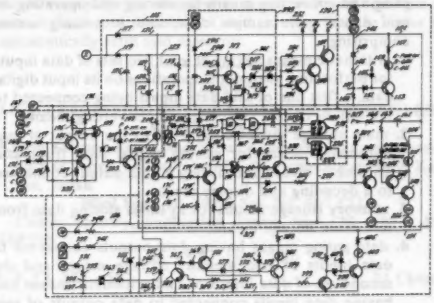


means and the input impedance of said receiver demodulating means equalling the characteristic impedance of said cable interconnect means; and means connecting the output of said modulating signal source to said antenna assembly modulating means.

3,967,281
DIAGNOSTIC ANNUNCIATOR

Ernest C. Dageford, Irvine, Calif., assignor to BEC Products, Inc., Irvine, Calif.

Filed Jan. 20, 1976, Ser. No. 543,017
Int. Cl.² G08B *19/00*
U.S. Cl. 340—415 **17 Claims**



1. An annunciator adapted for use with a boiler having a flame safeguard programmer providing first and second signals each representative of an associated first and second fault in the boiler and with the second fault occurring subsequent to the first fault, the programmer also providing an alarm signal when the flame of the boiler goes out in response to the first fault, the annunciator comprising:

first means responsive to the first signal to provide a third signal representative of the first fault;

second means responsive to the second signal to provide a fourth signal representative of the second fault;

third means responsive to the third signal to provide a first visual indication of the first fault and responsive to the fourth signal for providing a second visual indication of the second fault, the third means having memory characteristics for maintaining the first visual indication even if the third signal ceases; and

fourth means coupled to the first means and the second means and responsive to the alarm signal for inhibiting the third signal and the fourth signal; whereby

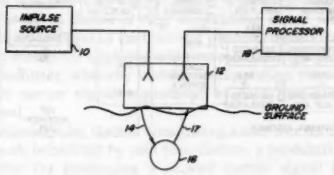
only the first indication is provided by the third means during the continuance of the alarm signal.

3,967,282

UNDERGROUND PIPE DETECTOR

Jonathan D. Young, Worthington, and Ross Caldecott, Columbus, both of Ohio, assignors to The Ohio State University, Columbus, Ohio

Filed Jan. 30, 1974, Ser. No. 437,927
Int. Cl.[2] G01S 9/02; G01V 3/12
U.S. Cl. 343—5 NA 6 Claims



1. A portable apparatus for use as an aid in detecting and identifying underground targets and comprising:
   a. means for generating a periodic electrical pulse having a duration substantially less than its period;
   b. antenna means connected to the generating means for radiating an electromagnetic pulse toward a target and for receiving reflected electromagnetic radiation to provide an analog echo signal;
   c. sampling and analog to digital converting means connected to said antenna means for converting the analog echo signal to digital data representing a plurality of samples of said echo signal;
   d. processing means connected to the output of said sampling and converting means for storing and operating on said digital echo sample data; said processing means comprising:
      1. arithmetic means having at least two sets of data inputs for performing arithmetic operations on its input digital data, a first one of said data inputs being connected to the output of said sampling and converting means;
      2. main storage means connected to the output of said arithmetic means for storing digital data from said arithmetic means and having a data output connected to a decoding and display means;
      3. memory storage means for at times storing data from said main storage means;
      4. data gating means having data outputs connected to data inputs of said memory storage means and the second set of data inputs of said arithmetic means and having data inputs connected to data outputs of said main storage means and said memory storage means for steering data from a selected one of its inputs to a selected one of its outputs; and
      5. control means including a mode selector for selecting and controlling the arithmetic operations.
   e. said decoding and display means being connected to the output of said processing means for displaying in analog form the processed echo sample data,
   wherein an operator may reposition said apparatus in response to displayed data and obtain further data.

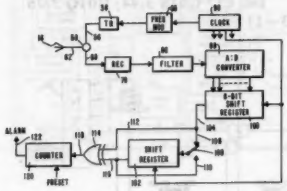
3,967,283

LARGE AREA MOTION SENSOR

Robert V. Clark, Washington, D.C.; Francis X. Linder, Landover, Md.; Terrance J. McCreary, Gaithersburg, Md., and William R. Taylor, Olney, Md., assignors to Automation Industries, Inc., Silver Spring, Md.

Continuation-in-part of Ser. No. 442,025, Feb. 13, 1974, abandoned. This application Sept. 26, 1974, Ser. No. 509,571
Int. Cl.[2] G01S 9/42
U.S. Cl. 343—7.7 22 Claims

1. A motion sensor for detecting intruder motion within a protected area and for discriminating against motion outside the protected area, comprising:
   transceiver means including means for transmitting frequency modulated continuous wave signals in a pattern to cover said protected area, said transmitted signals having a selected, repetitive frequency sweep, and means for receiving signals reflected by target scatterers;
   means for demodulating said received signals to produce an ensemble of audio tones, each tone representing the range of a target scatterer;
   noise filter means for said tones, said filter means discriminating against tones produced by noise and clutter;



   range filter means for discriminating against tones received from target scatterers outside a predetermined zone;
   means for storing values representing said audio tones for a first frequency sweep of said transmitter;
   means for comparing said stored values with corresponding values derived from a second frequency sweep of said transmitter and for producing error signals corresponding to differences between the values corresponding to said first and second frequency sweeps, said differences representing motion of a target scatterer within said protected area; and
   alarm means responsive to a predetermined number of error signals.

3,967,284

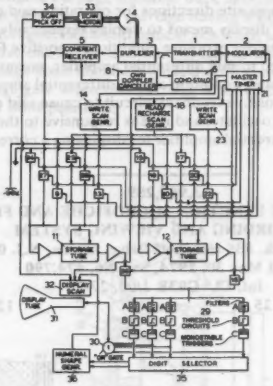
RADAR APPARATUS FOR DETECTING A COHERENT DOPPLER SIGNAL IN CLUTTERED ENVIRONMENTS

Eric Lawrence Casling White, Iver, England, assignor to EMI Limited, Hayes, England

Filed Jan. 22, 1965, Ser. No. 428,286
Claims priority, application United Kingdom, Jan. 22, 1964, 2864/64
Int. Cl.[2] G01S 9/42, 9/46
U.S. Cl. 343—9 11 Claims

1. Radar apparatus comprising means for generating a series of pulses of oscillation, scanning aerial means for transmitting said pulses as a beam narrow in azimuth in different directions sequentially, the repetition frequency of said pulses being sufficiently high in relation to the angular velocity of the aerial means and the angle of the beam that a plurality of successive transmitted pulses impinge on a point target, a coherent receiver for reflected energy, means for storing returns derived from said receiver in response to a plurality of successive pulses of oscillation from said transmitting means, means for selecting returns corresponding to a predetermined range stored in said storing means, and means for examining se-

lected returns to detect a cyclic component of substantially constant periodicity indicating the presence of a target at said



predetermined range having a radial velocity relative to the apparatus represented by said periodicity.

3,967,285

METHOD FOR FORMING IMAGES BY DIFFERENTIAL OXIDATION

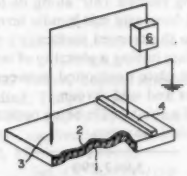
Shigenobu Sobajima, Hachioji; Hiroshi Okaniwa; Kiyoshi Chiba, both of Hino, and Norio Takagi, Ogaki, all of Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 378,241, July 11, 1973, Pat. No. 3,902,180. This application Jan. 17, 1975, Ser. No. 542,042

Claims priority, application Japan, July 12, 1972, 48-69039; July 17, 1972, 47-70726; Sept. 4, 1972, 47-87902; Dec. 25, 1972, 48-368; Dec. 27, 1972, 48-2232; May 4, 1973, 48-49014

Int. Cl. G01d *15/34*; C23c *13/00*

U.S. Cl. 346—74 E **7 Claims**



1. A method for forming images in which an electrically conductive coating, formed on a base material, which coating comprises at least one of the group of indium, tin, titanium, and zirconium, and is substantially opaque and lowly oxidized, is successively oxidized by directly contacting a recording electrode with the coating, applying an electrical signal across the recording electrode and the coating, having the electrode scan relative to the coating so that the coating is selectively heated and oxidized by the electric current which flows in response to the electrical signal to form images composed of substantially transparent parts in the base material.

3,967,286

INK SUPPLY ARRANGEMENT FOR INK JET PRINTERS

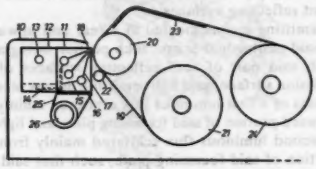
Roger Ingemar Andersson, Angered, and Stig Bertil Sultan, Floda, both of Sweden, assignors to Facit Aktiebolag, Atvidaberg, Sweden

Filed Dec. 26, 1974, Ser. No. 536,607

Claims priority, application Sweden, Dec. 28, 1973, 7317525

Int. Cl.² G01D *15/16*

U.S. Cl. 346—140 R **10 Claims**



1. An ink jet printing device for recording medium comprising a printing head adapted to move back and forth along said recording medium and provided with a plurality of output nozzles through which ink droplets are propelled onto the recording medium to selectively form indicia thereon, a pumping chamber for each nozzle being in communication therewith, an ink reservoir, at least one channel connecting said ink reservoir with said pumping chambers, means mounting said ink reservoir for movement which follows the movement of said printing head, said reservoir continuously feeding the pump chambers with ink through said channel, and a fixed liquid supply device arranged to co-act with said reservoir in one or both end positions of said printing head in order to automatically refill said reservoir.

3,967,287

LIGHT RECEIVING DEVICE FOR USE IN A SINGLE LENS REFLEX CAMERA

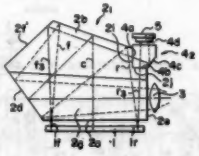
Kazuo Kimura, Sakai, and Yasuo Yamazaki, Kawachinagano, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Sept. 19, 1974, Ser. No. 507,522

Claims priority, application Japan, Sept. 20, 1973, 48-109278

Int. Cl.² G03B *17/20*

U.S. Cl. 354—56 **21 Claims**



1. A light receiving apparatus for use in a system for measuring light beams which have passed through an objective lens of a single lens reflex camera, the apparatus comprising:

a focussing plate disposed in a path of the light beams passing through the objective lens and for scattering such light beams as they pass therethrough, said focussing plate having a forward portion and a rear portion with respect to the objective lens;

an ocular lens through which an image on said focussing plate can be viewed;

a pentagonal prism for transmitting a substantial portion of the scattered light beams to said ocular lens, said pentag-

onal prism having a bottom surface located above said focussing plate, a pair of roof reflecting surfaces, a lower front reflecting surface, and a rear emission surface located adjacent to said ocular lens, so that said substantial portion of said scattered light beams is introduced through said bottom surface, reflected on said pair of roof reflecting surfaces, reflected on said lower front reflecting surface, and emitted from said rear emission surface towards said ocular lens;

light reflecting means located at a front and upward portion of said pentagonal prism, such portion being adjacent to both said pair of roof reflecting surfaces and said lower front reflecting surfaces;

light emitting means located at a rear and upward portion of said pentagonal prism, such portion being adjacent to both said pair of roof reflecting surfaces of said rear emission surface, said light emitting means receiving light beams of a first luminous flux scattered mainly from said forward portion of said focussing plate and light beams of a second luminous flux scattered mainly from said rear portion of said focussing plate, such that said first luminous flux is introduced through said bottom surface of said pentagonal prism, reflected by said light reflecting means and received by said light emitting means, whereas said second luminous flux is introduced through said bottom surface of said pentagonal prism and directly received by said light emitting means;

a transparent block mounted on said light emitting means, said transparent block having a joint surface with said light emitting means, such that both said first and second luminous fluxes pass through said joint surface, a reflecting surface for reflecting one of said first and second luminous fluxes and an emission surface for emitting both of said first and second luminous fluxes after one has been reflected on said reflecting surface of said transparent block and after the other has passed directly through said transparent block; and,

light responsive means located adjacent to said emission surface of said transparent block for receiving said first and second luminous fluxes.

3,967,288

ELECTRIC SHUTTER OPERATING CIRCUITS

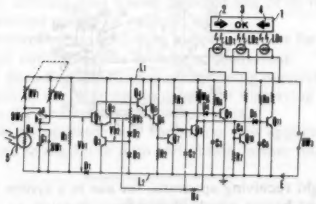
Masaru Yamamoto, Machida, Japan, assignor to Yashica Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1974, Ser. No. 501,505

Claims priority, application Japan, Sept. 6, 1973, 48-103918[U]

Int. Cl.² G03B 7/00

U.S. Cl. 354—60 L **5 Claims**



1. An electric exposure circuit for use in a photographic camera having a shutter and an over and under exposure display means, comprising means responsive to the brightness of an object to be photographed for producing a first signal representing said brightness, a first transistor normally connected to respond to said first signal of said brightness responsive means, an adjustable resistor settable in accordance with the photosensitivity of the photographic film used, a voltage divider circuit including said adjustable resistor and a second transistor connected to respond to the output voltage of said adjustable resistor, circuit means connecting said first and second transistors as a differential amplifier for comparing the relative magnitude of said voltage and said first signal, means responsive to the comparison output signal of said differential amplifier which is produced when said differential amplifier is unbalanced in opposite directions for operating said over and under exposure display means to display respectively an over exposure or an under exposure condition, a positive feedback circuit connected to said differential amplifier, means responsive to the balanced condition of said differential amplifier for actuating said positive feedback circuit to cause said differential amplifier to oscillate, and means responsive to the oscillation of said differential amplifier for displaying a correct exposure condition.

3,967,289

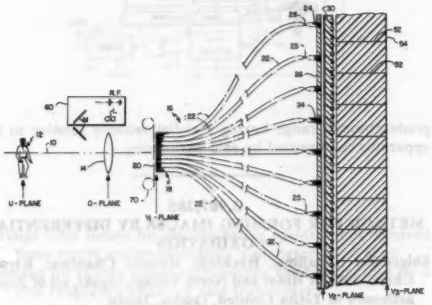
MULTIPLE FUNCTION MICROFICHE AND FILM RECORDING AND VIEWING SYSTEM

George J. Yevick, 536 Nordhoff Drive, Leonia, N.J. 07605

Filed May 30, 1974, Ser. No. 474,790

Int. Cl.² G03B 1/00, 27/00

U.S. Cl. 354—125 **12 Claims**



1. A multiple function optical apparatus including,

a. an objective lens,

b. a bundle of internally reflecting coherent optic fibers, said bundle having a main, bunched end and being divided along the remainder of its length into sub-bundles, each sub-bundle itself also being coherent throughout its length, the termini of the sub-bundles diverging from and spaced from each other and defining a surface, each sub-bundle being twisted 180° along its length,

c. a screen spaced from said sub-bundle termini, said screen being parallel to the termini surface,

d. a transparent plate having a plurality of integral lensettes,

e. said transparent plate positioned between the termini of said sub-bundles and said screen,

f. each terminal of a sub-bundle being optically aligned with at least one of said lensettes.

3,967,290

MINIATURE MIRROR REFLEX CAMERA

Heinz Waaske, Mascherode, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Oct. 2, 1974, Ser. No. 511,191

Claims priority, application Germany, Oct. 5, 1973, 2350438

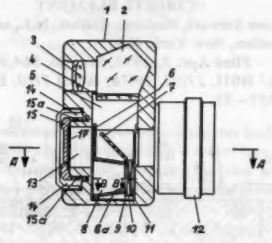
Int. Cl.² G03B 19/12, 15/00

U.S. Cl. 354—154 **2 Claims**

1. A reflex camera including lens means establishing an optical axis, said camera being adapted to contain a conventional miniature film cassette of the type having enlarged rounded film-containing portions at both ends of the cassette and a straight portion between the enlarged rounded portions and flanges extending longitudinally along the lateral edges of said straight portion and projecting therefrom in a forward

direction perpendicularly to film in said straight portion, film being advanced through said straight portion in a direction perpendicular to said optical axis, said camera also including means forming an image gate aligned with said optical axis and lying in front of film in said straight portion of said cassette, said camera further comprising:

a. a slidable carriage shiftable back and forth between two limit positions, said carriage having a light deviating device aligned with said optical axis when said carriage is in a first one of its said limit positions and having a light passage shaft aligned with said optical axis and with said image gate when said carriage is in the second one of its said limit positions;



b. means guiding said slidable carriage for movement from one limit position to the other limit position in a direction substantially perpendicular to said optical axis and also substantially perpendicular to said direction in which the film is advanced and through said straight portion of said cassette;

c. a central shutter permanently mounted in said light passage shaft of said slidable carriage and movable bodily with said carriage; and

d. means on said carriage blocking passage of light along said optical axis to said image gate except only through said light passage shaft.

3,967,291

SHUTTER CONTROLLED FILM ADVANCING APPARATUS

Motoi Nagashima, Tokyo, Japan, assignor to Cima Kogaku Company Limited, Tokyo, Japan

Filed Nov. 12, 1974, Ser. No. 523,060

Claims priority, application Japan, Nov. 13, 1973, 48-126795; Nov. 22, 1973, 48-131920

Int. Cl.² G03B 1/18

U.S. Cl. 354—171 **5 Claims**

1. A photographic camera having a film take-up mechanism for either manually or automatically taking up the film, which comprises:

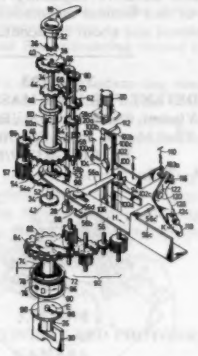
a film take-up shaft;

a first directional clutch means;

a manual actuating means having a shaft which is connected to one end of the film take-up shaft through the first directional clutch means;

a second directional clutch means having an operational direction opposite to that of the first directional clutch means; and

a spring motor having a rotary drive shaft which is connected to the other end of the film take-up shaft through the second directional clutch means; each axis of said film



take-up shaft, said shaft of the manual actuating means and said rotary drive shaft being aligned with each other.

3,967,292

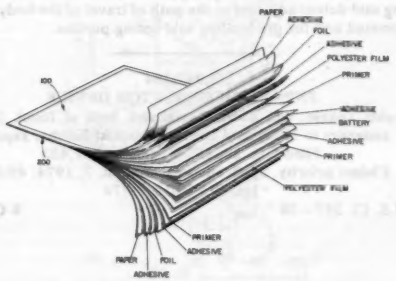
FILM ASSEMBLY INCLUDING A HERMETICALLY SEALED BATTERY

Robert M. Delahunt, Norwell, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 23, 1974, Ser. No. 535,206

Int. Cl.² G03B 17/26; H01M 2/02

U.S. Cl. 354—174 **10 Claims**



1. In a photographic film assembly which comprises, in combination:

a. a photographic film cassette including a withdrawal orifice positioned in a wall of the cassette through which a supply of photographic film is adapted to be selectively withdrawn;

b. a supply of photographic film positioned in the cassette for selective withdrawal from the cassette through the orifice;

c. a flat, planar, primary battery positioned in the cassette and including, in combination; anode materials, sheet type separator elements, cathode materials and electrolyte combined with sheet type current collectors all combined to form a multicell structure providing contacts for external connection of said battery;

the improvement wherein said battery positioned in said cassette is hermetically sealed in sealing means to prevent evolution of gaseous materials from said battery, said sealing means comprising first and second laminar struc-

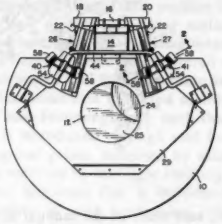
tures each of which comprise a thin fiberous sheet material bonded to a foil sheet material which is bonded to a non-conductive plastomeric sheet material having a heat activatable adhesive capability for providing effective sealing of said laminar assemblies about peripheral portions thereof and about said contacts of said battery.

3,967,293

DETENT FOR LOW MASS OBJECT

Andrew W. Vincent, 65 Aberdeen St., Rochester, N.Y. 14611

Filed May 9, 1975, Ser. No. 576,032
Int. Cl.² G03B *9/02*
U.S. Cl. 354—252 **3 Claims**



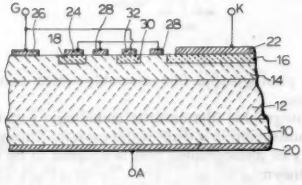
1. A detent for arresting the motion of a body of relatively small mass comprising a single piece of spring wire having a portion arranged as a torsion spring, an arm portion extending outwardly from said spring portion and shaped for abutting engagement by the body to be stopped and to be driven by that engagement in a direction to torque said spring portion, said arm portion being generally U-shaped and including a tip at the end of its leg opposite from said spring portion bent into axial alignment with said spring portion, and means for mounting said detent adjacent to the path of travel of the body to be arrested and for pre-loading said spring portion.

3,967,294

PNPN SEMICONDUCTOR DEVICE

Yahei Takase, and Akira Kawakami, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 30, 1974, Ser. No. 537,423
Claims priority, application Japan, Jan. 7, 1974, 49-5475
Int. Cl.² H01L *29/74*
U.S. Cl. 357—38 **8 Claims**



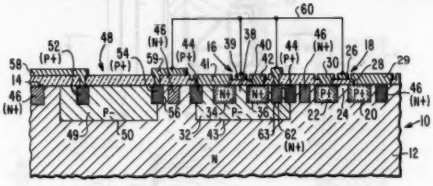
1. A PNPN semiconductor device comprising a PNPN semiconductor substrate having a pair of opposite main faces and including a cathode emitter layer and an auxiliary emitter layer identical in conductivity to each other, and disposed on one of said main faces and spaced away from each other, a cathode base layer disposed adjacent said cathode emitter layer on the one main face, and an anode emitter layer disposed on the other main face; an anode electrode disposed in ohmic contact with said anode emitter layer; a cathode electrode disposed in ohmic contact with said cathode emitter layer; an auxiliary emitter electrode disposed in ohmic contact with said auxiliary emitter layer; a gate electrode disposed in ohmic contact with that portion of said cathode base layer disposed on that side of said auxiliary emitter layer remote from said cathode emitter layer; at least one auxiliary electrode disposed in ohmic contact with said cathode base layer and spaced away from said cathode electrode; a semiconductor diode including one semiconductor layer disposed on that portion of said cathode base layer located between said cathode emitter layer and said auxiliary emitter layer and spaced away from said at least one auxiliary electrode; said one semiconductor layer being opposite in conductivity to said cathode base layer to form a PN junction therebetween; another electrode disposed in ohmic contact with said semiconductor layer; and means for electrically connecting said another electrode to said gate electrode.

3,967,295

INPUT TRANSIENT PROTECTION FOR INTEGRATED CIRCUIT ELEMENT

Roger Green Stewart, Neshanic Station, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 3, 1975, Ser. No. 564,911
Int. Cl.² H01L *27/02, 29/78;* **H02H** *7/20;* **H03K** *3/353*
U.S. Cl. 357—51 **3 Claims**



1. A semiconductor device comprising:

a. a body of semiconductor material of one conductivity type, said body having a surface;

b. a first region extending into said body from said surface and forming a first PN junction with the surrounding portions of said body;

c. a first zone of the same type as and of higher degree of conductivity than the remainder of said first region extending into said surface at one end of said first region and forming a second PN junction with the portions of said body adjacent said first zone;

d. a second zone of the same type as and of higher degree of conductivity than the remainder of said first region extending into said surface within said first region, said second zone being spaced from said first zone, all parts of said second zone being surrounded on said surface by material of said first region over at least a first predetermined distance along said surface from said first PN junction, whereby there is a first resistance between said first zone and said second zone and a first distributed ballasting resistance between said second zone and said first PN junction;

e. a second region extending into the surface of said body of the same conductivity type as said body and of higher conductivity than said body, all parts of said second region being at least a second predetermined distance along said surface from said second zone, whereby there will be a second distributed ballasting resistance between those parts of said first PN junction which surround said second zone and said second region;

f. first contact means making ohmic contact to said first zone; and

g. second contact means making ohmic contact to said second zone, whereby said first resistance is between said first contact means and said second contact means, said first ballasting resistance is between said second contact means and one side of said first PN junction, said second ballasting resistance is between the other side of said first PN junction and said second region, and said second PN

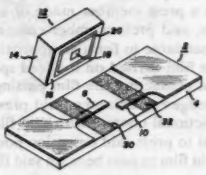
junction is between said first contact means and said second region.

3,967,296

SEMICONDUCTOR DEVICES

Alexander M. Intrator, Dewitt, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Oct. 12, 1972, Ser. No. 296,792
Int. Cl.[2] H01L 39/02, 23/48, 29/46; H02B 1/04
U.S. Cl. 357—80 5 Claims



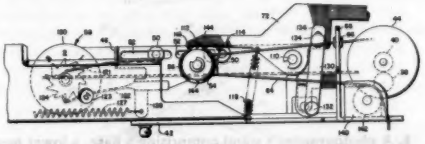
1. In a semiconductor device, a semiconductor body having at least one metallic contact situated on a major face thereof, a glass support member having a sealing surface, a layer of metal on at least a portion of said sealing surface adapted to constitute at least one electrical lead for the semiconductor body, said semiconductor body and said sealing surface being disposed in confronting contacting relation with said metallic contact in registry with said lead, means forming a permanent thermo-electrostatic bond uniting said support member to said semiconductor body, and an insulative layer on said support member covering at least the portion of said lead nearest the side wall of said semiconductor body, said insulative layer having a thickness of about 1000 to 20000 Angstroms and being sandwiched between direct contact with said lead and direct contact with the outer marginal edge portion of the major face of said semiconductor body to prevent shortcircuiting of said lead to said semiconductor body sidewall during or subsequent to the formation of said bond.

3,967,297

INTERLOCK MECHANISM FOR PHOTOGRAPHIC PROCESSNG SYSTEM

Vaito K. Eloranta, Needham, and Benjamin C. Ruggles, Gloucester, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 23, 1974, Ser. No. 535,378
Int. Cl.[2] G03B 17/50
U.S. Cl. 354—83 21 Claims



1. Photographic apparatus comprising:

means for locating a plurality of film units in position for sequential exposure;

means for initiating an exposure of a film unit;

film transport and processing means mounted in position to receive an exposed film unit as it is moved away from said exposure position;

film advancing means mounted for movement between a first position wherein it is in position to engage the exposed film unit and advance it toward said film transport and processing means and a second position wherein a portion of the exposed film unit is in engagement with said film transport and processing means;

drive means for moving said film advancing means between said first and second positions and for driving said film transport and processing means;

means for biasing said film advancing means toward said first position;

means engageable by said film advancing means during movement of said film advancing means from said first position for preventing said film advancing means from returning to said first position under the force of said biasing means; and

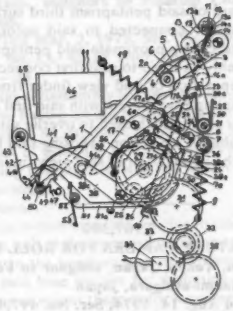
means responsive to actuation of said initiating means for moving said engageable means out of engagement with said film advancing means thereby allowing said film advancing means to return to said first position under the influence of said biasing means.

3,967,298

ELECTRICALLY CONTROLLED PHOTOGRAPHIC CAMERA

Günter Adamski, Braunschweig, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Continuation-in-part of Ser. No. 417,411, Nov. 19, 1973, Pat. No. 3,878,546. This application Feb. 11, 1974, Ser. No. 441,501
Claims priority, application Germany, Nov. 20, 1972, 2256795; Oct. 10, 1973, 2350733; Nov. 6, 1973, 2355295
Int. Cl.[2] G03B 19/12, 1/18
U.S. Cl. 354—153 17 Claims

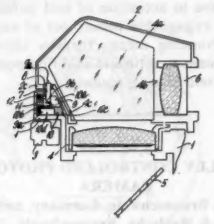


1. A photographic camera having a plurality of functions to be performed during one complete cycle of operations to take one photograph, a step-by-step switch advancing through successive steps to initiate performance of said functions, an electric motor for performing at least one of said functions, means operated by said step-by-step switch for closing a circuit to said motor to start the running of the motor when said switch reaches a predetermined one of its steps, means responsive to the running of said motor for keeping said circuit closed independently of said step-by-step switch so that said motor may continue to run for an interval after said step-by-step switch has advanced to a subsequent step and is no longer effective to close said circuit, and means also responsive to the running of said motor for opening said circuit to stop the running of said motor when said motor has run for an interval sufficient to accomplish its function.

3,967,299
SINGLE LENS REFLEX CAMERA WITH INTERCHANGEABLE VIEW FINDER HAVING ELECTRICAL COUPLING

Tetsuji Shono, Saitama, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 13, 1974, Ser. No. 505,713
Claims priority, application Japan, Sept. 20, 1973, 48-106259
Int. Cl.² G03B 13/02
U.S. Cl. 354—219 6 Claims

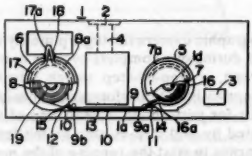


1. A single lens reflex camera comprising a camera body having a lens carrying front face and a rear face and housing a first electrical circuit, a view finder interchangeably mounted on said camera body and forwardly and rearwardly slidable between coupled and uncoupled positions on said camera body and including a pentaprism having a lower front upwardly, forwardly inclined third surface and a casing housing said pentaprism and a second electrical circuit, a first electrical connector connected to said first circuit and mounted on said camera body and disposed in the area proximate and forward of said pentaprism third surface, a second electrical connector connected to said second circuit and mounted on said casing proximate said pentaprism third surface and releasably coupled to said first connector and moveable with the separation of said view finder from said camera body out of coupling engagement with said first connector and a cover member resiliently biased to overlie said first connector and retractable to a position exposing said first connector in response to the application of said view finder to said camera body.

3,967,300
MINIATURE CAMERA FOR ROLL FILM

Shigeru Oshima, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 14, 1974, Ser. No. 497,447
Claims priority, application Japan, Aug. 17, 1973, 48-92150
Int. Cl.² G03B 17/02
U.S. Cl. 354—288 3 Claims

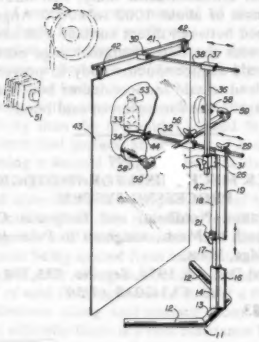


1. In a miniature camera for a roll film and including a lens and a body having therein a chamber for accommodation of a feed spool carrying unexposed film, a chamber for accommodation of a take-up spool for wind-up of exposed film, and a passageway which provided communication between said chambers, said passageway being defined by an inner wall, a rear wall and a bottom floor of said camera body, said inner wall having formed therein an opening permitting exposure of successive film frames to light directed to the lens of said camera, whereby, successive rolls of film on successive feed and take-up spools are loaded into or unloaded from said camera and successive frames of a loaded film are carried from a feed spool to a position for exposure and thence onto said take-up spool, upon rotation of said spools, the improvement comprising: a first body eave portion projecting over an open chamber portion adjacent to the entrance of said passageway and intermediate said passageway entrance and the mounting axis of a feed spool within the feed spool chamber, to prevent vertical displacement of a film passing through said passageway, and a press member made of a material having elastic properties, said press member comprising an arcuate main portion expandable to form an approximate semi-circle and fitting on the film carried on the feed spool, and a radial extension portion contacting the film passing from said feed spool to said passageway entrance, said press member being moved due to frictional contact with said film upon rotation of said feed spool to press said extension portion against said film and cause said film to pass beneath said first eave portion.

3,967,301
PHOTOGRAPHER'S COPY STAND

Lee M. Corning, c/o Corning Photography 1012 Washington St., San Carlos, Calif. 94070

Filed Nov. 4, 1974, Ser. No. 520,276
Int. Cl.² G03B 15/00
U.S. Cl. 354—292 4 Claims

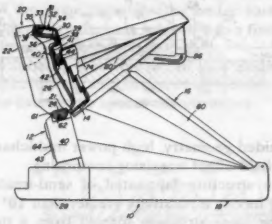


1. A photographer's stand comprising a base, a lower member extending vertically upward from said base, a slide vertically adjustably positioned on said lower member, a horizontal first socket and a vertical second socket on said slide, a lower horizontal rod horizontally adjustably positioned in said first socket, a pedestal for an object to be photographed on the outer end of said lower rod, a sheet apertured for projection of said lower horizontal rod, a vertical rod in said second socket, a third socket on the upper end of said vertical rod, an upper horizontal rod horizontally adjustably positioned in said third socket, and a horizontal support rod on the outer end of and disposed transverse to said upper horizontal rod, and support means on said support rod for supporting the upper edge of said sheet.

3,967,302
ACCESSORY ATTACHMENT FOR PHOTOGRAPHIC APPARATUS

Gerald J. Cote, Plymouth; John A. Lewis, Jr., Stoneham, and James K. Skurski, Beverly, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 16, 1974, Ser. No. 533,326
Int. Cl.² G03B 17/56
U.S. Cl. 354—295 4 Claims



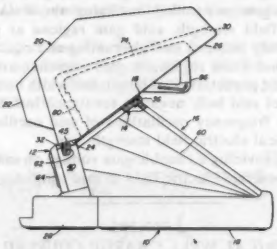
1. An accessory attachment for use with a camera having a front wall mounting a lens, and wall-forming means extending rearwardly from said front wall, said camera being formed with a socket and provided with recess-forming means, said accessory attachment comprising:

a camera accessory device and a housing mounting said accessory device therein, said housing including an accessory-mounting front portion and being formed with a lower surface receivable on said wall-forming means of said camera, said housing further comprising means forming a rear wall generally perpendicular to said surface, latch means movably mounted on said rear wall in substantially spaced relation to said surface and releasably engageable with said recess-forming means, and plug means attached to and extending from said housing, said plug means being receivable in said socket to cooperate with said latch means in securing said accessory device on said camera.

3,967,303
ACCESSORY ATTACHMENT FOR CAMERAS

Richard V. Fischer, West Warwick, R.I., and Richard C. Kee, Chestnut Hill, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 16, 1974, Ser. No. 533,329
Int. Cl.² G03B 17/56
U.S. Cl. 354—295 2 Claims



1. An electronic flash attachment for a camera having a lens-shutter housing formed with a front wall mounting a lens and a top wall extending rearwardly from the front wall and formed with a downwardly extending socket, and further including an upper housing wall extending rearwardly and upwardly from the top wall of the lens-shutter housing and formed with a rear edge portion, and a viewfinder mounted on the upper housing wall, said electronic flash attachment comprising an electronic flash unit, a housing mounting said flash unit therein, and means for detachably connecting said housing to the camera, said housing comprising first housing wall means forming a lower surface adapted to engage and be supported on the top wall of the lens-shutter housing of the camera, second housing wall means inclined rearwardly and upwardly from and formed integral with said first housing wall means and adapted to engage and be supported on the upper housing wall of the camera, third housing wall means formed integral with said second housing wall means and forming a recess shaped to receive the viewfinder of the camera, and fourth housing wall means formed integral with said first, second and third housing wall means and completing an enclosure about said electronic flash unit including housing regions on four sides of said third housing wall means, said means for detachably connecting said housing to the camera comprising a plug mounted on said first housing wall means, protruding therefrom, and formed to engage the socket of the camera, and first and second hook means attached to said second housing wall means on either side of said third housing wall means and adapted to engage the rear edge portion of the upper housing wall of the camera.

3,967,304
MODULAR CONSTRUCTED SEQUENCING SYSTEM FOR PHOTOGRAPHIC APPARATUS

Bruce K. Johnson, Andover, and David E. Van Allen, Malden, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1975, Ser. No. 554,778
Int. Cl.² G03B 1/00, 17/00, 19/02
U.S. Cl. 354—83 18 Claims

1. A modular subassembly for use in a self-developing camera of the type having an operating cycle during which a film unit is exposed at an exposure position and is then advanced between a pair of pressure applying rollers for distributing a fluid processing composition within the film unit, said subassembly comprising:

a base section;

film advance means movable relative to said base for engaging a film unit at the exposure position and advancing the film unit to the pressure applying rollers of the camera;

means on said base section for mounting and guiding said film advance means thereon for movement along a predetermined path of travel relative to said base section;

film counting means having indicia thereon for counting and visually displaying the number of cycles of camera operation said counter means being adapted to be rotatably mounted on said base section such that it may be indexed one indica for each cycle of camera operation;

means on said base section for rotatably mounting said film counter means;

sequencing means, including a rotatable sequencing gear, for controlling the sequence of certain events in a cycle of camera operation including moving and positioning said film advance means along said predetermined path of travel and indexing said film counting means, said sequencing gear being configured to rotate through a single 360° revolution during the course of a cycle of camera operation such that said film advance and counting means are operated thereby in a relationship that is dependent upon the angular disposition of said sequencing gear relative to a predetermined starting position;

means on said base section for rotatably mounting said sequencing gear thereon in operative relation with said film advance and counting means;

a motor including a drive shaft having a drive gear thereon for providing power for rotating said sequencing gear and at least one of the pair of camera rollers having a drive gear thereon to cause a film unit to be advanced between the rollers;

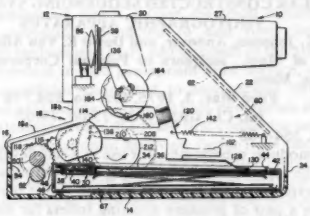
means on said base section for receiving and supporting said motor thereon;

a gear train including a plurality of gears adapted to be interconnected for coupling said motor drive gear in a driving relation to said sequencing gear and the drive gear on the one roller;

means on said base section for rotatably mounting said plurality of gears in operative relation with each other, said sequencing gear, said motor drive gear and the roller drive gear;

a retaining section adapted to be connected to said base section for retaining said film advance means, said film counting means, said sequencing gear, and said gear train in proper operative relation with one another intermediate said base and retaining sections; and

connecting means, for connecting said base and said retaining section, said connecting means including at least one two-part connector of the snap-together type, one of said two parts being on said base section and the other of said two parts being on said retaining section such that said base section and retaining section may be snapped together after said film advance means, film counting means, sequencing gear and gear train have been mounted on said base section.



14. A modular subassembly for use in a camera of the self-developing type including a pair of fluid spreading rollers and means for locating a film unit in position for exposure and having a cycle of operation including the exposure and processing of the film unit, said subassembly comprising the following components in combination:

a first mounting member;

second mounting member;

a motor;

film advance means for displacing the film unit from its exposure position into another position wherein a leading edge of the film unit is disposed between the rollers;

a gear adapted to be coupled in driving relationship with at least one of the rollers when said modular assembly is operably positioned within the camera;

means on one of said mounting members for mounting said motor;

means on at least one of said mounting members for displaceably mounting said film advance means;

means on one of said mounting members for rotatably mounting said gear;

means mounted on one of said mounting members for driving said gear and said film advance means from said motor; and

means for connecting said mounting members together, said mounting members serving to mount said recited components comprising said subassembly as a self-supporting integral module when so connected together.

3,967,305

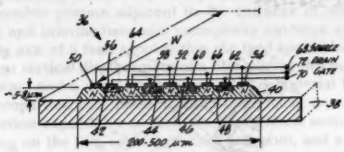
MULTICHANNEL JUNCTION FIELD-EFFECT TRANSISTOR AND PROCESS

Rainer Zuleeg, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Mar. 27, 1969, Ser. No. 811,154

Int. Cl.[2] H01L 21/78, 27/26

U.S. Cl. 357—3 **4 Claims**



1. A one-sided geometry, high power multichannel, unipolar junction field-effect transistor comprising:

a substrate structure fabricated of semi-insulating GaAs material having a resistivity greater than 10^4 ohm-cm;

an isolating mesa structure formed from a thin epitaxial layer of N-type GaAs semiconductor material with a donor concentration between 5×10^{14} and 5×10^{15} cm^{-3}, electron mobilities between 6,000 and 8,000 cm^2/volt-sec provided on a top surface of said substrate structure and susceptible of bulk negative resistance instabilities during operation of said field-effect transistor above a critical electric field strength, said substrate structure surface being larger than the supported surface of said mesa structure to provide a one-sided geometry with reduced gate capacitance;

a plurality of source, gate and drain structures provided in a coplanar arrangement directly on said mesa structure in respectively separate transverse coplanar regions thereof and having electrical source, gate and drain leads connected correspondingly thereto, each of said gate structures including a PN-junction having a length and width equal to that of its gate region and largely located in a plane positioned at a predetermined depth from the surface of its corresponding gate region and separating P-type material from the N-type material of said mesa structure, said gate regions being of predetermined length and width and extending equally spaced in parallel over the full width of said mesa structure and being positioned respectively between alternating and equally spaced source and drain regions of predetermined width and similar length to said gate regions to control a plurality of respective channels in an interdigitated structure which functions as a highly reliable, stable and very low leakage current small signal amplifier below said critical electric field strength, and as an easily varied, high frequency and multiple gate controlled oscillator above said critical electric field strength, said gate regions as positioned respectively between said alternating and equally spaced source and drain regions in said coplanar arrangement and of said predetermined length and width being capable to control said bulk negative resistance instabilities and the high frequency oscillations of said oscillator above said critical electric field strength; and

means for providing a variable gate voltage on said gate lead to produce said electric field in said transistor.

3,967,306

ASYMMETRICAL WELL CHARGE COUPLED DEVICE

Robert W. Bower, Manhattan Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

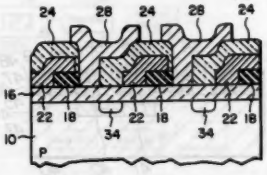
Continuation-in-part of Ser. No. 384,601, Aug. 1, 1973, abandoned. This application Nov. 27, 1974, Ser. No. 527,680

Int. Cl.[2] H01L 27/10, 29/78

U.S. Cl. 357—24 **12 Claims**

1. A charge coupled device designed to have a minimum component line width of predetermined size, comprising:

a. a semiconductor substrate;
b. a first set of gate electrodes insulatingly spaced from a surface of said substrate and laterally spaced from each other over said surface by a distance equal to their width and equal to said predetermined minimum component line width;
c. means insulatingly spacing a respective half-width portion of each one of said gate electrodes a greater amount from said substrate surface than the other half-width portion thereof, whereby to establish an asymmetrical potential well of the same directionality under each one of said electrodes when they are subjected to a first phase clocking voltage;
d. means forming a second set of gate electrodes insulatingly spaced from said first set and interleaved therewith so as to overlie the spaces therebetween;



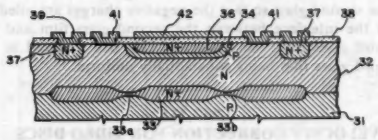
e. means disposed between said second electrode set and said substrate for causing an asymmetrical potential well to be established under each one of the electrodes thereof upon the application thereto of a second phase clocking voltage, which potential wells have the same directionality as those established under said first electrode set, thereby to produce a bit width spanning the distance between corresponding portions of any two adjacent gate electrodes of the same phase that is twice said minimum component line width; and
f. means for confining charge carriers within a channel region in said semiconductor substrate, said channel region extending under said first and second sets of gate electrodes in the direction of the directionality of said asymmetrical potential wells, said channel region having a width equal to said predetermined line width perpendicular to the direction of said directionality.

3,967,307

LATERAL BIPOLAR TRANSISTOR FOR INTEGRATED CIRCUITS AND METHOD FOR FORMING THE SAME

Richard S. Muller, Kensington, and Lewis K. Russell, San Jose, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 383,810, July 30, 1973, abandoned. This application July 10, 1975, Ser. No. 594,700
Int. Cl.² H01L *29/72, 29/48, 29/56, 29/64*
U.S. Cl. 357—35 **4 Claims**



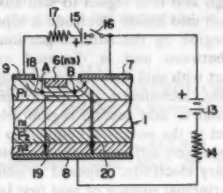
1. In an integrated circuit a lateral bipolar transistor having increased current gain comprising a semiconductor substrate of a first conductivity type having an epitaxial semiconductor layer of a second conductivity type formed thereon, a buried layer of said second conductivity type formed between said epitaxial layer and substrate, an emitter region of said first conductivity type formed in said epitaxial layer overlying the buried layer and extending to the surface of said epitaxial layer with a PN emitter base junction being defined between the emitter region and the epitaxial layer, means for enhancing lateral current from said emitter region to said collector region and for retarding current flow in a vertical sense perpendicular to the lateral direction said enhancing means including at least one island of second conductivity type formed in said emitter region and further including a collector region formed in said epitaxial layer spaced from and adjacent to said emitter region.

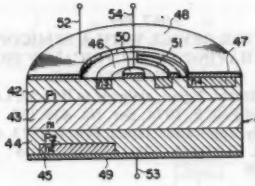
3,967,308

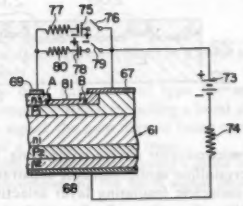
SEMICONDUCTOR CONTROLLED RECTIFIER

Tsutomu Yatsuo; Tatsuya Kamei; Takuzo Ogawa, and Tomoyuki Tanaka, all of Hitachi, Japan, assignors to Hitachi, Ltd., Hitachi, Japan

Continuation of Ser. No. 293,097, Sept. 28, 1972, abandoned. This application Mar. 15, 1974, Ser. No. 451,679
Claims priority, application Japan, Oct. 1, 1971, 46-76343; Oct. 4, 1971, 46-77098
Int. Cl.² H01L *29/74*
U.S. Cl. 357—38 **8 Claims**







5. A semiconductor controlled rectifier comprising:
a first layer of semiconductor material having a first principal surface and including a first region of p-type conductivity;
a second layer of semiconductor material of n-type conductivity disposed in contact with and forming a first pn junction with said first layer at the first region thereof;
a third layer of semiconductor material of said p-type conductivity disposed in contact with and forming a second pn junction with said second layer;

a fourth layer of semiconductor material of said n-conductivity type disposed in contact with and forming a third pn junction with a first prescribed surface area portion of said third layer and having a second principal surface;

an anode electrode, disposed in ohmic contact with a relatively large selected surface area portion of said first principal surface of said first layer including a surface portion of said first region thereof, for coupling a relatively positive potential to said first region;

a cathode electrode, disposed in ohmic contact with said second principal surface of said fourth layer, for coupling a relatively negative potential to said fourth layer;

an auxiliary electrode, disposed in ohmic contact with said first layer of semiconductor material at a portion of said first principal surface thereof, spaced apart from said anode electrode, for coupling a potential, which is relatively negative from said relatively positive potential, to the spaced apart portion of said first layer; and wherein

said first layer further includes a second region of semiconductor material of said n-conductivity type, extending from said first principal surface into said first region of said first layer, so as to form a fourth pn junction with said first region, said second region being disposed at least between a path extending from said anode electrode through said first region to said auxiliary electrode, and wherein said anode electrode is separated from said second region by the surface portion of said first region therebetween and is disposed exclusively in ohmic contact with said first region of said first layer;

and further including a gate electrode, for coupling a gate potential to said second region relatively negative with respect to the potential coupled to said anode electrode and relatively different from the potential coupled to said auxiliary electrode, disposed in ohmic contact with said first principal surface of said first layer, so that said gate electrode is disposed between said anode electrode and said auxiliary electrode.

3,967,309

SEMICONDUCTOR DEVICE WITH A SEMICONDUCTOR SUBSTRATE HAVING DIELECTRICALLY ISOLATED FUNCTIONAL REGIONS

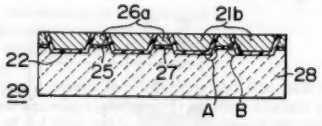
Kenzi Miyata, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 5, 1974, Ser. No. 439,702

Claims priority, application Japan, Feb. 7, 1973, 48-14642

Int. Cl.² H01L *27/04, 27/12, 29/06*

U.S. Cl. 357—49 **14 Claims**



1. A semiconductor device comprising, in combination:

a polycrystalline semiconductor substrate; and

a first dielectric insulating layer selectively disposed on a plurality of portions of a first surface of said substrate;

a plurality of functional monocrystalline semiconductor regions respectively disposed on said selectively disposed first dielectric insulating layer so as to be insulated from the respective portions of said first surface of said substrate; and wherein

each monocrystalline semiconductor region is electrically isolated from adjacent monocrystalline semiconductor regions by a polycrystalline semiconductor region therebetween, which polycrystalline semiconductor region is electrically isolated from both said monocrystalline regions and said substrate; and wherein

the angle formed by the side portions of a monocrystalline region and the first dielectric insulating layer on which said monocrystalline region is disposed is an obtuse angle.

3,967,310

SEMICONDUCTOR DEVICE HAVING CONTROLLED SURFACE CHARGES BY PASSIVATION FILMS FORMED THEREON

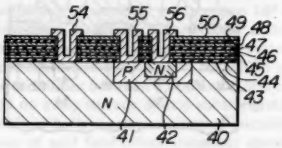
Masatada Horiuchi, Koganei; Takashi Tokuyama, Hoya, and Takao Miyazaki, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 224,453, Feb. 8, 1972, abandoned, which is a continuation of Ser. No. 864,700, Oct. 8, 1969, abandoned. This application Nov. 30, 1973, Ser. No. 420,590

Claims priority, application Japan, Oct. 9, 1968, 43-73134; July 7, 1969, 44-53035

Int. Cl.² H01L *27/04, 29/78, 29/94*

U.S. Cl. 357—54 **11 Claims**



1. A semiconductor device having controlled surface charges at the surface of a semiconductor substrate comprising:

a. a semiconductor substrate having a pn junction extending to one surface thereof;

b. a silicon dioxide film of about 300 to 1500 angstroms in thickness disposed upon the surface of said semiconductor substrate so that negative charges are induced by the film at the surface of the substrate;

c. a first glass film having about 300 to 1500 angstroms in thickness and selected from one material of boro-silicate glass and phospho-silicate glass, said first glass film covering the passivation film so that negative charges are piled up at the interface of the passivation film and the first glass film, the density of the corresponding one material of boron and phosphorus in the first glass film being substantially uniform; and

d. a second glass film having abut 300 to 1500 angstroms in thickness and selected from the other material of borosilicate glass and phospho-silicate glass, said second glass film covering the first glass film so that negative charges are piled up at the interface of the first glass and the second glass films, with the density of the corresponding other material of boron and phosphorus in the second glass film being substantially uniform, whereby the density of the charges induced by the passivation film at the surface of the semiconductor substrate is controlled by the charges induced at the respective interfaces, and

further comprising a third glass film of said one material with a thickness of 300 to 1500 angstroms and covering the second glass so that the negative charges are piled up at the interface between the second glass film and the third glass film, the density of said one material in the third glass film being substantially uniform.

3,967,311

VELOCITY CORRECTION FOR VIDEO DISCS

Jack Selig Fuhrer, Princeton Junction, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1974, Ser. No. 522,819

Int. Cl.² H04N *5/76, 5/80*

U.S. Cl. 358—8 **9 Claims**

1. In a video disc player in which a signal pickup stylus cooperates with a signal information storing groove of a video

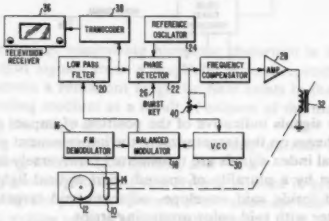
disc, said information storing groove including recorded luminance, chrominance and color synchronization signal components, and said signal components as recovered by said pickup stylus being subject to recurring frequency and phase errors as a consequence of errors in velocity of relative motion between said disc groove and said pickup stylus, apparatus for providing correction of said signal component errors comprising:

means coupled to said signal pickup stylus for decoding signals provided from said video disc;

a voltage controlled oscillator;

heterodyning means receptive to signals from said decoding means and said voltage controlled oscillator for frequency translating the constituent components of said decoded signal;

a reference oscillator for providing signals at a reference frequency;



means receptive to signals from said heterodyning means and said reference oscillator for providing an error signal indicative of departures, if any, of a color synchronization component in the frequency translated output of said heterodyning means from correspondence in frequency with said reference frequency;

means for rendering said voltage controlled oscillator responsive to said error signal to control the frequency thereof in a manner opposing said departures from said frequency correspondence; and

transducer means coupled to said pickup stylus for repositioning said stylus along the groove of said video disc records in response to said error signal in a manner opposing said errors in velocity of relative motion.

3,967,312

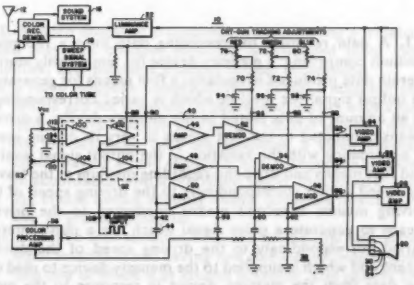
COLOR TELEVISION CHROMA DEMODULATOR CIRCUIT

Lawrence Ray Sample, Huntington Beach, Calif., assignor to Motorola, Inc., Chicago, Ill.

Filed Nov. 18, 1974, Ser. No. 524,425

Int. Cl.² H04N 9/50

U.S. Cl. 358—23 **14 Claims**



1. A direct current (DC) biasing circuit for a chroma demodulator circuit which includes a plurality of demodulators for demodulating a chrominance input signal to supply color signals in a televesion receiver, the DC biasing circuit comprising:

means adapted to receive a power supply voltage for providing a regulated voltage which is independent of variations in the magnitude of said power supply voltage, said regulated voltage having a zero temperature coefficient, said means for providing a regulating voltage including turn-around circuit means having an output terminal;

amplifier means coupled between an output of said means for providing a regulated voltage and said output terminal of said turn-around circuit means for providing an output signal between first and second output terminals thereof, said output signal having a zero differential temperature coefficient; and

first circuit means coupled to said first and second output terminals of said amplifier means for providing a plurality of output control signals at respective output terminals, said output control signals having amplitudes which are independently adjustable, said output control signals being independent of temperature variations and being coupled to respective ones of the plurality of demodulators so that the direct current (DC) output level of the demodulators can be varied as said amplitudes of said output control signals from said circuit means are varied to adjust the background of the television color image without effecting the gain of the demodulators.

3,967,313

CHROMINANCE SIGNAL GAIN CONTROL CIRCUIT

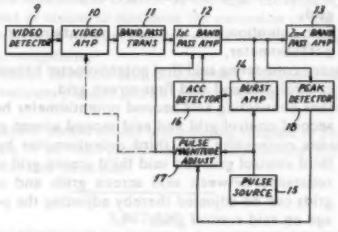
Seiji Miyamoto, Yao, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Mar. 19, 1974, Ser. No. 452,557

Claims priority, application Japan, Mar. 20, 1973, 48-33933

Int. Cl.² H04N 9/535

U.S. Cl. 358—27 **8 Claims**



1. A chrominance signal control circuit in a color television apparatus, comprising:

amplifying means of a gain control type for selectively amplifying a composite signal including a burst signal and a chrominance signal, the gain thereof being controllable as a function of a control voltage input,

means for providing a pulse signal having a pulse width and a phase time encompassing the burst signal of said composite signal,

means receiving the selectively amplified composite signal output of said amplifying means and responsive to the pulse signal from said pulse signal providing means for extracting the burst signal from the selectively amplified composite signal,

means for receiving and peak detecting the extracted burst signal and supplying the peak detected burst signal output thereof to said amplifying means as the control voltage input,

means receiving the selectively amplified composite signal output of said amplifying means and providing a peak detected output of the chrominance signal only, of said

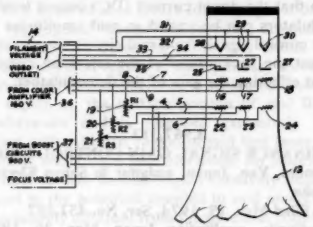
composite signal, when the peak detected chrominance signal output exceeds a predetermined value, and

means responsive to the burst extracting pulse signal for producing a control pulse output, said means receiving the peak detected chrominance signal output for automatically adjusting the magnitude of the control pulse and supplying the control pulse to said amplifying means for selectively controlling the gain thereof for amplification of the burst signal, thereby to afford peak color control of the selectively amplified, composite signal output of said first amplifying means.

3,967,314
COLOR BRIGHTNESS CONTROL

Russell E. Anglin, San Jose, Calif., assignor to Oneida Electronics, Meadville, Pa.

Filed Sept. 19, 1975, Ser. No. 614,978
Int. Cl.² H04N 9/18
U.S. Cl. 358—29 **5 Claims**



1. A television color brightness control for a color television tube having screen grids and control grids comprising,

a first control grid, a second control grid and a third control grid,

a first screen grid, a second screen grid and a third screen grid,

a first potentiometer, a second potentiometer and a third potentiometer,

means connecting said first potentiometer between said first control grid and said first screen grid,

means connecting said second potentiometer between said second control grid and said second screen grid,

means connecting said third potentiometer between said third control grid and said third screen grid whereby the resistance between said screen grids and said control grids can be adjusted thereby adjusting the positive voltage on said control grids.

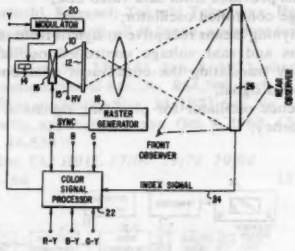
3,967,315
BEAM-INDEX COLOR TELEVISION DISPLAYS

David M. Goodman, 14272 Half Moon Bay Drive, Del Mar, Calif. 92014

Continuation-in-part of Ser. No. 345,197, Feb. 17, 1964, Pat. No. 3,826,867. This application May 22, 1974, Ser. No. 472,154
Int. Cl.² H04N 9/31, 9/24
U.S. Cl. 358—60 **34 Claims**

4. For a beam-index line-screen multi-color projection television display apparatus, a display screen mountable against a wall for scanning by an optical beam of energy comprising: a plurality of optically sensitive strip-like regions of different color producing elements; and beam-index means comprising a plurality of optically sensitive spaced apart strip-like regions, in register with the color producing elements, which produce optical index signals in response to excitation by the optical scanning beam, light pipe means for transmitting these optical index signals transversely of the display screen to the periphery thereof, and means for combining the thus transmitted signals.

11. In a beam-index line-screen color cathode ray tube having an envelope with an electron gun section for providing a scannable electron beam and faceplate section with a target screen having a repeating array of different color producing strips for generating a viewable image, said target screen also having index-signal generating means which provide optical

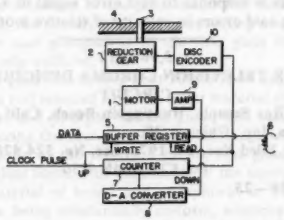


index signals indicative of the position of impact of the electron beam on the target screen; the improvement wherein said optical index signals are transmitted transversely of the target screen by a plurality of spaced apart optical light pipes disposed inside said envelope, adjacent said target screen, in register with said color producing strips.

3,967,316
DATA RECORDER

Satoshi Suyama, and Kazuhiko Endow, both of Yokohama, Japan, assignors to The Tsurumi-Seiki Co., Ltd., Yokohama, Japan

Filed Dec. 17, 1974, Ser. No. 533,622
Claims priority, application Japan, Dec. 22, 1973, 48-303174
Int. Cl.² G11B 5/09
U.S. Cl. 360—51 **6 Claims**

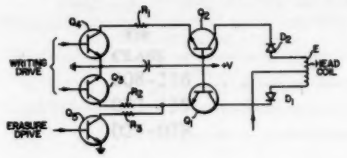


1. A data recorder for recording data onto a recording medium comprising: a memory device for temporarily storing therein data produced irregularly; a first means for generating an output signal the level of which is varied correspondingly to an amount of data stored in the memory device; a driving means connected to the first means to vary its driving speed in accordance with the variation in the output signal level of said first means and drive the recording medium at the traveling speed varied correspondingly to the driving speed of the driving means; a second means connected to the driving means to generate a pulse signal which has a pulse interval varied correspondingly to the driving speed of the driving means and which is supplied to the memory device to read out the data from the memory device in response to the pulse signal; and a transducer connected to the read out terminal of the memory device to record the data onto the recording medium.

3,967,317
PREDISTORTION OF NRZ RECORDING CURRENT FOR VIDEO RECORDINGS

George F. Newell, Sutton, England, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 24, 1974, Ser. No. 536,056
Int. Cl.² G11B 5/02
U.S. Cl. 360—55 2 Claims



1. A method of minimizing harmonic distortion in the replayed output signals from a magnetic record/reproduction system wherein a remanent magnetic field exists in the magnetic recording medium as a result of erasure of the medium, comprising the steps of:

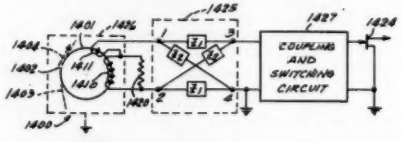
supplying alternate half cycles of writing current to the recording head of said system, and

adjusting the amplitude of said writing current in synchronism with the polarity reversal of the alternate half cycles of said writing current to establish a current ratio between alternate half cycles of said writing current to produce uniform spacing between the replayed output signals from said magnetic record/reproduction system.

3,967,318
VIDEO MAGNETIC TRANSDUCER SYSTEM WITH PHASE CORRECTING NETWORK

Marvin Camras, Glencoe, Ill., assignor to IIT Research Institute, Chicago, Ill.

Continuation of Ser. No. 312,514, Dec. 6, 1972, abandoned, and a continuation-in-part of Ser. No. 34,504, May 4, 1970, Pat. No. 3,705,954, which is a division of Ser. No. 649,256, June 27, 1967, Pat. No. 3,596,008. This application Aug. 9, 1974, Ser. No. 496,293
Int. Cl.² G11B 5/45
U.S. Cl. 360—65 2 Claims



1. A video magnetic transducing system having a wideband video playback channel including a grounded input video amplifier, said playback channel further comprising:

a. a video magnetic transducer head having a magnetic core with a gap for coupling of the magnetic core with a magnetic record medium and having electric winding means on the magnetic core for supplying a video playback signal having a time sequence and a frequency spectrum in accordance with a television signal, said electric winding means having winding output terminals floating relative to ground potential,

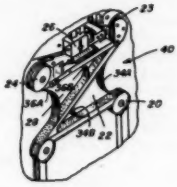
b. a passive four terminal network having first and second input terminals, and having first and second output terminals one of which is at ground potential, said passive four terminal network comprising first impedances connected respectively directly between said first input terminal and said first output terminal, and directly between said second input terminal and said second output terminal, and comprising second impedances connected respectively directly between said first input terminal and said second output terminal, and directly between said second input terminal and said first output terminal, and

c. completely passive conductor means floating relative to ground potential and providing direct conductive connections between the winding output terminals and the first and second input terminals of said four terminal network, without the interposition of any transformer between the electric winding means on the magnetic core of the transducer head and the output terminals of said four terminal network, whereby the first and second impedances of said passive four terminal network are all effective for correcting the video playback signal as supplied from the head.

3,967,319
TAPE EXCURSION CONTROL MEANS USING TAPERED-WALL VACUUM COLUMN

Robert F. McCollum, Oklahoma City, Okla., assignor to Telex Computer Products, Inc., Tulsa, Okla.

Filed July 1, 1974, Ser. No. 484,606
Int. Cl.² G11B 15/58, 15/48
U.S. Cl. 360—90 7 Claims



1. In a magentic tape system having at least one tapered-wall vacuum column for control of the tape movement, the improvement in means to minimize the excursion of the tape in the tapered-wall vacuum column under increasing tension in the tape, comprising:

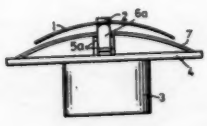
a. wall means between said tapered-wall vacuum column and a vacuum plenum and an opening in said wall means; and

b. check valve means across said opening adapted to permit free flow of air from said column to said plenum, but not in the reverse direction.

3,967,320
ARRANGEMENT FOR GUIDING A RAPIDLY ROTATING RECORD CARRIER FOIL

Wolfgang Fell, Konstanz, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed July 30, 1974, Ser. No. 493,345
Claims priority, application Germany, Aug. 2, 1973, 2339131
Int. Cl.² G11B 15/64, 5/012, 21/04, 21/18
U.S. Cl. 360—102 8 Claims



1. In a system for guiding a rapidly rotating record carrier foil to give the foil a curvature which is stationary in space and which has a crest line disposed along a diameter of the foil, the

foil being guided, to have such curvature, with the aid of a flow of air between the foil and guide surfaces, and the foil being not guided in regions angularly spaced from the guide surfaces and extending to the edge of the foil, wherein said guide surfaces comprise:

a bar located at that side of the foil location at which the foil presents a concave curvature, said bar presenting a surface adjacent the foil location which constitutes a guide surface, said bar being oriented with its length perpendicular to the orientation of the foil crest line and having a length greater than the diameter of the foil and a width less than the diameter of the foil; and

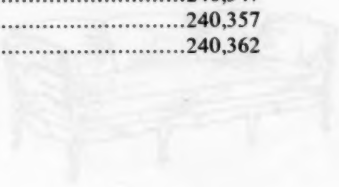
two guide elements located entirely at that side of the foil location at which the foil presents a concave curvature, said elements being located at respectively opposite sides of said bar and of the axis of foil rotation and spaced from said bar, said guide elements each presenting a surface adjacent said foil location which constitutes a guide surface, at least one of said elements including a scanning head for information recorded on the foil.

DESIGN PATENTS

GRANTED JUNE 29, 1976

ERRATA

For CLASS	See PATENT NO.
008–216	240,347
023–139	240,357
025–078	240,362



DESIGN PATENTS

GRANTED JUNE 29, 1976

ERRATA

Class	Patent No.
008-216	240,347
023-129	240,357
023-078	240,362

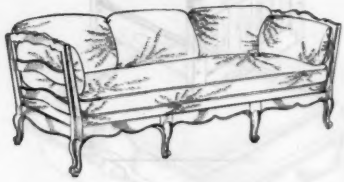
DESIGNS

JUNE 29, 1976

240,340
SHOE SOLE AND HEEL UNIT
Aubrey Askew, Southport, England, assignor to Dunlop Limited, London, England
Filed Aug. 12, 1974, Ser. No. 496,839
Claims priority, application Great Britain Feb. 23, 1974
Term of patent 14 years
The term of this patent subsequent to Oct. 1, 1988, has been disclaimed
Int. Cl. D2—*04*
U.S. Cl. D2—320

240,341
COMBINED TOOTHBRUSH AND DENTAL FLOSS HOLDER
William K. Najjar, 2875 Taft SW., Wyoming, Mich. 49509
Filed Mar. 22, 1974, Ser. No. 453,727
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—18

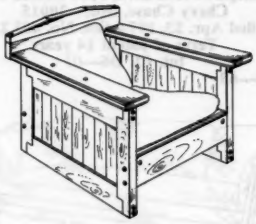
240,342
SOFA OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Apr. 23, 1974, Ser. No. 463,286
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



240,343
TABLE FOR FOOD PRODUCTS DISPLAY
Franklin Moore, Jr., 902 McBurney Drive, Lebanon, Ohio 45036
Filed Apr. 30, 1974, Ser. No. 465,537
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—20

240,344
SOFA OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Apr. 23, 1974, Ser. No. 463,287
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

240,345
SEAT OR SIMILAR ARTICLE
Matthew F. Callahan III, Corte Madera, Calif., assignor to Monastery Furniture Manufactory, Rohnert Park, Calif.
Filed Apr. 29, 1975, Ser. No. 572,779
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71



240,346
FURNITURE ARM OR SIMILAR ARTICLE
Burton H. Kaplan, Potomac, Md., assignor to Rowe Furniture Corporation
Filed Sept. 30, 1974, Ser. No. 510,584
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194

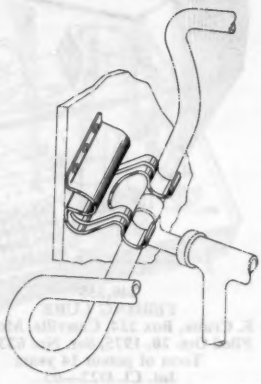
240,347
SNATCH BLOCK
Edward L. Vick, 4861 Seven Hills Road, Castro Valley, Calif. 94546, and Arlie E. Smith, 3791 Mosswood Drive, Lafayette, Calif. 94549
Filed May 19, 1975, Ser. No. 578,394
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D8—216

240,348
CHAIR
Svante Schoblom, Pipplarp, S–573 00, Tranas, Sweden
Filed July 16, 1974, Ser. No. 488,978
Claims priority, application Sweden Jan. 18, 1974
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

240,349
MICROWAVE OVEN
Jozef Joan Waagen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 27, 1974, Ser. No. 455,239
Claims priority, application Sweden Oct. 1, 1973
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128

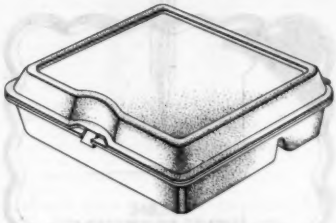
240,350
ARTICLE OF FLATWARE
Richard O. Cragin, Warwick, R.I., assignor to Gorham, a Division of Textron Inc., Providence, R.I.
Filed Jan. 29, 1975, Ser. No. 545,313
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

240,351
BICYCLE HANGER
Alexander L. Generalis, Michael C. Roberto, and David A. White, all of 249 S. 10th St., Philadelphia, Pa. 19107, and Dann S. Sheftelman, 4405 Pine St., Philadelphia, Pa. 19104
Filed Dec. 19, 1974, Ser. No. 534,633
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—235



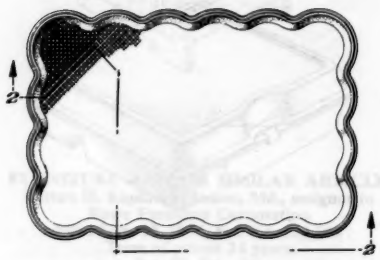
240,352
COMBINED BOTTLE AND STOPPER
Marie Joseph Coffy, Paris, France, assignor to Saint-Gobain-Desjonqueres, Levallois-Perret, France
Filed Jan. 30, 1975, Ser. No. 545,701
Claims priority, application France Sept. 24, 1974
Term of patent 3½ years
Int. Cl. D9—*01*
U.S. Cl. D9—118

240,353
COMPARTMENTED FOOD CONTAINER
Richard Thomas Edwards, 13 Howard Drive, Middletown, N.Y. 10940
Filed Feb. 26, 1974, Ser. No. 445,944
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—183

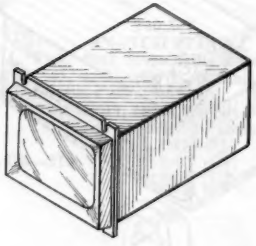


240,354
BOX FOR SMOKE DETECTORS
William Finkelstein, Baltimore, Md., assignor to Universal Security Instruments, Inc., Baltimore, Md.
Filed Apr. 2, 1974, Ser. No. 457,162
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—197

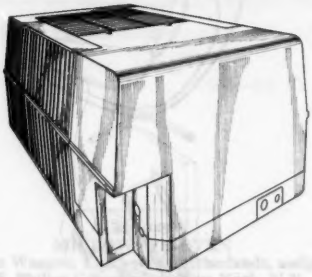
240,355
PACKAGING TRAY FOR CANS OR THE LIKE
Gilbert R. Chadbourne, Oakland, Maine, assignor to Keyes Fibre Company
Filed Jan. 13, 1975, Ser. No. 540,690
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



240,356
CATHODE RAY OSCILLOSCOPE OR THE LIKE
Richard A. Johnson, 124 W. Washington St., and Douglas E. Scott, 1225 Idlewild Drive, both of Round Lake, Ill. 60073
Filed Jan. 16, 1975, Ser. No. 541,550
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—76

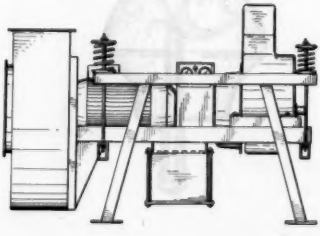


240,357
CASING FOR REFRIGERATION SYSTEM CONDENSING UNITS OR THE LIKE
Walter W. Hoyle and Richmond S. Hayes, Jr., Fayetteville, and Curtis L. Tobin, Chittenango, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Jan. 4, 1974, Ser. No. 430,806
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



240,358
FISHING LURE
Nay E. Cruise, Box 324, Cassville, Mo. 65625
Filed Oct. 20, 1975, Ser. No. 623,668
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

240,359
FAN UNIT FOR PUBLIC SHELTERS
Matti Purhonen and Launo Laakkonen, Helsinki, Finland, assignors to Temet Oy, Helsinki, Finland
Filed Aug. 14, 1973, Ser. No. 388,167
Claims priority, application Finland Feb. 16, 1973
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—162

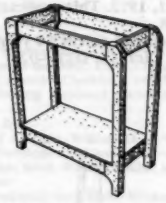


240,360
ACOUSTIC COUPLED REMOTE DATA ENTRY TERMINAL OR SIMILAR ARTICLE
George E. Chadima, Jr., Cedar Rapids, and Robert A. Bruce, Marion, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa
Filed Aug. 21, 1974, Ser. No. 499,210
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

240,361
DICTATING MACHINE
Rebertus van de Poel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation-in-part of abandoned design application Ser. No. 317,951, Dec. 26, 1972. This application July 22, 1974, Ser. No. 490,726
Claims priority, application Switzerland June 30, 1972
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B

240,362
LINK CHAIN SUPPORT POST
Michael T. Russo, Bloomfield Hills, Mich. (1805 Larchwood St., Troy, Mich. 48084)
Filed May 20, 1974, Ser. No. 471,404
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—78

240,363
AQUARIUM STAND
Leslie J. Weigel, Cincinnati, Ohio, and Elmer A. Wolfzorn, Fort Thomas, Ky., assignors to Manual Arts Furniture Company, Cincinnati, Ohio
Filed Apr. 4, 1975, Ser. No. 565,268
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D30—12

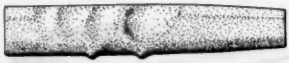


240,364
SET OF CHESSMEN
Amleto Ghelli, Montclair, N.J. (6 Magnolia St., Belleville, N.J. 07019)
Filed Feb. 25, 1974, Ser. No. 445,354
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CH

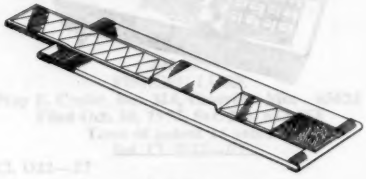
240,365
TEAM STANDING DISPLAY
Eva J. Bennett, 3843 Treeline Drive, Dallas, Tex. 75224
Filed Mar. 7, 1974, Ser. No. 448,831
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D34—5 MM

240,366
GOLF PUTTER HEAD
Raymon W. Cook, San Antonio, Tex., assignor to Ray Cook Golf Putters, Inc.
Continuation of design applications Ser. No. 293,529 and Ser. No. 293,530, both Sept. 29, 1972, and Ser. No. 343,390, Mar. 21, 1973. This application June 14, 1974, Ser. No. 479,458
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

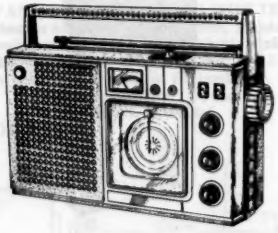
240,367
HANDLE GRIPPING SLEEVE FOR A TENNIS RACKET OR THE LIKE
James R. Cope, 10500 Cherokee Lane, Leawood, Kans. 66108
Filed Sept. 4, 1974, Ser. No. 503,174
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST



240,368
WRISTWATCH STRAP
Dennis K. Button, 143 W. Powers Circle, 205, Littleton, Colo. 80120
Filed Nov. 7, 1974, Ser. No. 521,563
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D45—4 E



240,369
RADIO RECEIVER
Ken Kawamura, Ibaragi, Osaka, and Kunio Hoshino, Kadoma, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Oct. 17, 1974, Ser. No. 515,634
Claims priority, application Japan May 11, 1974
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF JUNE, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See—*
Cremer, Charles W.; Eastman, James E.; and Schanefelt, Robert V., 3,966,990.

A.G.S. Food System Inc.: *See—*
McGuckian, Ambrose T., 3,966,980.

A. H. Robins Company, Incorporated: *See—*
Cale, Albert Duncan, Jr.; and Leonard, Charles Arthur, 3,966,957.
Lerner, Irwin S., 3,965,891.

A. Nattermann & Cie GmbH: *See—*
Baganz, Horst; and May, Hans-Joachim, 3,966,757.

A-Tech, Inc.: *See—*
Anderson, Richard G., 3,967,197.

Abbe, Gunter; Eppe, Rudolf; Ettelbruck, Rudiger; Pfeifer, Josef; and Schnall, Gunther, to AGFA-Gevaert, A.G. Apparatus for manipulating finished reproductions in copying machines. 3,966,194, Cl. 271-186.000.

Abbott Laboratories: *See—*
Carter, George W., 3,966,944.
D'Alo, Herbert Fred, 3,965,946.
Prasad, Raj Nandan; and Stein, Herman Hal, 3,966,917.
Redmer, Wilbert; Rolin, Kenneth; and Nittel, Herman, 3,966,038.

Abe, Hidetoshi: *See—*
Toriyama, Kazuhisa; Abe, Hidetoshi; Nakano, Fumio; Murao, Kenji; and Sato, Mikio, 3,966,631.

Abel, Heinz; Dobinson, Bryan; Green, George Edward; Harris, Melvin; Stark, Bernard Peter; and Winterbottom, Kenneth, to Ciba-Geigy Corporation. Modifying textiles and fibers. 3,967,041, Cl. 428-419.000.

Abex Corporation: *See—*
Thurston, David L., 3,965,921.

Abrams, Ellis; and Barber, Sidney, to E. F. Houghton and Company. Aqueous base post pickling and cold rolling fluid. 3,965,712, Cl. 72-42.000.

Abrams, Hyman. Holder for containers and napkins. 3,966,103, Cl. 224-48.00R.

Abramson, Daniel J. Multi-digital surgical scrub brush. 3,966,335, Cl. 401-10.000.

Abularach, Antonio Dabura. Envelope sealing apparatus for cold process tire retreading. 3,966,535, Cl. 156-394.000.

Acevedo, John: *See—*
Cooper, Herbert Warren; Acevedo, John; and deKlerk, John, 3,967,221.

Acher, Aureliu J.: *See—*
Mazur, Yehuda; Freeman, Dalia; and Acher, Aureliu J., 3,966,777.

Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED: *See—*
Glaesener, Ernest, 3,966,173.

Adachi, Takeshi: *See—*
Suzuki, Shigeru; and Adachi, Takeshi, 3,965,790.

Adachi, Tomio: *See—*
Tanabe, Takashi; and Adachi, Tomio, 3,967,025.

Adams, Clyde C. Freeze refining method. 3,966,445, Cl. 62-58.000.

Adams, Guy, to Solitron Devices, Inc. Solid state voltage regulator. 3,967,186, Cl. 322-28.000.

Adams, Herbert J. F.; and Takman, Bertil H., to Astra Pharmaceutical Products, Inc. Synergistic local anesthetic compositions. 3,966,934, Cl. 424-251.000.

Adamski, Gunter, to Rollei-Werke Franke & Heidecke. Electrically controlled photographic camera. 3,967,298, Cl. 354-153.000.

Addor, Roger Williams, to American Cyanamid Company. Insecticidal and acaricidal, pyrethroid compounds. 3,966,959, Cl. 424-304.000.

Addressograph Multigraph Corporation: *See—*
Patzke, Robert C., 3,966,321.
Scholten, Frank L.; and Kubinak, Ronald A., 3,967,177.

Adey, Anthony John, to C.A.V. Limited. Frequency to voltage converters. 3,965,877, Cl. 123-139.00E.

Advance Manufacturing Corporation: *See—*
LaBoda, John Albert, 3,966,131.

AEG-Elotherm G.m.b.H.: *See—*
Seulen, Gerhard; Reinke, Friedhelm; and Stengel, Edgar, 3,967,089.

Aeroquip Corporation: *See—*
Easton, Richard L.; and Buseth, Richard A., 3,965,947.
Thiessen, Leo K., 3,966,237.

AGA Aktiebolag: *See—*
Wiklund, Klas Rudolf, 3,966,328.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Weber, Philippe, 3,965,725.

Agency of Industrial Science & Technology: *See—*
Hamasaki, Masanobu; and Tateiwa, Fumikazu, 3,967,090.
Mukushi, Toshimi; Izumi, Kenkichi; Takahashi, Sankichi; Okazima, Yoshiaki; Sawa, Toshio; and Komai, Mithumasa, 3,966,562.

AGFA-Gevaert, A.G.: *See—*
Abbe, Gunter; Eppe, Rudolf; Ettelbruck, Rudiger; Pfeifer, Josef; and Schnall, Gunther, 3,966,194.
Becker, Manfred, 3,966,476.
Pfeifer, Josef; and Schnall, Gunther, 3,966,316.
Wagensonner, Eduard; and Stenzenberger, Volkmar, 3,966,312.

AGFA-GEVAERT N.V.: *See—*
Van Poucke, Raphael Karel; and Baeyens, Freddy Carolus, 3,966,475.

Ahmad, Mohammad, to Fisons Limited. Filter in sample drawing device. 3,966,606, Cl. 210-136.000.

Ahrweiler, Karl-Heinz; Appenzeller, Valentin; Quoos, Kurt; and Kusters, Eduard, to Eduard Kuesters Maschinenfabrik. Roller chains for a continuous press. 3,965,769, Cl. 74-245.00R.

Aichinger, Gerd: *See—*
Reisdorff, Josef Helmut; Aichinger, Gerd; Haberkorn, Axel; Kolling, Heinrich; and Kranz, Eckart, 3,966,725.

Ainsworth, Phillis. Bedding assembly. 3,965,504, Cl. 5-334.00C.

Airco, Inc.: *See—*
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Airway Industries Inc.: *See—*
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Aisin Seiki Kabushiki Kaisha: *See—*
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Akashi, Goro: *See—*
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Akatani, Hisashi: *See—*
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Aktieselskabet Niro Atomizer: *See—*
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Akzo N.V.: *See—*
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Toth, Anton; and Meyer, Gerhard, 3,966,726.

Akzona Incorporated: *See—*
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Aladdin International, Inc.: *See—*
Sanford, Walter E., Jr.; and Rupp, Peter R. R., 3,966,099.

Albinson, Don C., to Westinghouse Electric Corporation. Chair structure and tilt mechanism therefor. 3,966,252, Cl. 297-306.000.

Albright, Jack W., to Carpenter Chemical Company. Method of formulating solution containing dispersed nitrocellulose. 3,966,483, Cl. 106-171.000.

Albright, William D.: *See—*
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Farago, Frank John; Sood, Raman Radha; and Stokes, David Michael, 3,966,560.
Smith, Gordon Frederick; and Budd, Michael Keith, 3,966,619.

Aldrich, Paul H., to Hercules Incorporated. Stable rosin dispersions. 3,966,654, Cl. 260-24.000.

Alexander, John Ernest, to Sterling Drug Inc. N-[6,7]-Dihydroindolo[1,7-ab][1]benzazepin-2-yl)methyl/phthalimide. 3,966,762, Cl. 260-326.00D.

Alexander, Robert: *See—*
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Alexandrov, Nikolai Nikitievich; Zorev, Nikolai Nikolaevich; Krapukhin, Viktor Mikhailovich; Krotov, Viktor Vasilievich; Kryanin, Ivan Romanovich; Milman, Boris Samoilovich; Semenov, Pavel Vladimirovich; Sokolov, Nikolai Anatolievich; and Tinyakov, Viktor Gurievich. Device for centrifugal casting of hollow body with asymmetrical cross-section. 3,965,968, Cl. 164-287.000.

Alfa-Laval AB: *See—*
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Algaze, Isaac, to Rich Cue of Valley Stream Corporation. Articles for carrying identification. 3,965,590, Cl. 40-19.000.

Allain, Ronald J.: *See—*
Braithwaite, David G.; and Allain, Ronald J., 3,966,888.

Allard, Pierre, to Rhone-Poulenc-Textile. Difficultly inflammable threads, fibers and films of polyesteramides and process for obtaining them. 3,966,685, Cl. 260-78.00R.

Allen, Arthur A. Fish hook tier. 3,965,605, Cl. 43-1.000.

Allen, Clifford Edwin, to ISCA Electronics Limited. Weighing apparatus. 3,966,000, Cl. 177-1.000.

Allen, Walter E., to Peter Paul Electronics Co., Inc. Solenoid valve. 3,965,923, Cl. 137-315.000.

Allenwood Sports, Inc.: *See—*
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Allergan Pharmaceuticals: *See—*
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Stich, Frederick A., 3,967,173.
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Almasi, George S.; Hendel, Robert J.; Keefe, George E.; Lin, Yeong S.; and McGouey, Richard P., to International Business Machines Corporation. Method for making high density magnetic bubble domain system. 3,967,002, Cl. 427-132.000.
Almaula, Bipin C.; and Reif, Philip G., to United States of America, Army. Process of preparing a secondary electron emissive coating on the interior walls of a microchannel plate. 3,967,001, Cl. 427-78.000.
Almqvist & Wiksell Forlag AB: *See—*
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Aluminium Suisse S.A.: *See—*
Dolveck, Gilbert, 3,965,834.
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Amax Speciality Metal Corporation: *See—*
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Amax Specialty Metal Corporation: *See—*
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Ambrose, Wallace R. Device and method for calculating temperature and water vapor pressure. 3,965,724, Cl. 73-64.200.
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Amchem Products, Inc.: *See—*
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American Chemical & Refining Company Inc.: *See—*
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American Cyanamid Company: *See—*
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Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 3,966,773.
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American Hospital Supply Corporation: *See—*
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Amort, Andrew L., to Xerox Corporation. Apparatus for automatic microphotography. 3,966,318, Cl. 355-64.000.
Amor James J., to Columbus Auto Parts Company, The. Method of producing ball joints. 3,965,554, Cl. 29-149.50B.
Amos, Lynn G.; and Boone, Jerry S., to Corning Glass Works. Automatic focusing system. 3,967,109, Cl. 250-201.000.
AMP Incorporated: *See—*
Averitt, Marnie Carlton; and Bunnell, Edward Dennman, 3,967,195.
Ceresa, Myron; and Zimmerman, Richard Henry, 3,967,162.
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Andersen, Vernon K.; and Goddard, Michael W., to Sperry Rand Corporation. Storage interface unit. 3,967,247, Cl. 340-172.500.
Anderson, Bruce D.; and Holmes, Alton B., to Rockwell International Corporation. Automatic brake adjusting mechanism. 3,966,028, Cl. 188-196.0BA.
Anderson, Harold Peter; Lesser, George Albert; Lukas, Fredric; Maxon, Rodney Robert; and Viamour, James Hall, to Bell Telephone Laboratories, Incorporated. PBX automatic number identification system. 3,967,073, Cl. 179-18.0FH.
Anderson, Hyrum T.: *See—*
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Anderson, Joseph A.; Neukom, Chester G.; and Kopecky, Ivyl, to Haybuster Manufacturing Inc. Feed control for tub type hay grinder. 3,966,128, Cl. 241-73.000.
Anderson, Richard G., to A-Tech, Inc. Method for detecting moisture in multiple layer roofs. 3,967,197, Cl. 324-61.00R.
Anderson, Robert Craig; and Hall, Robert Arthur, to Imperial Chemical Industries Limited. Smoking mixture. 3,965,911, Cl. 131-2.000.
Anderson, Robert L., Jr.; and Russell, James B., to Essex International, Inc. Analog-to-digital converter. 3,967,270, Cl. 340-347.0NT.
Anderson, Rodney J.: *See—*
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Andersson, Erik Ingvar. Fastener for securing a structural member to concrete. 3,965,640, Cl. 52-704.000.
Andersson, Roger Ingemar; and Sultan, Stig Bertil, to Facit Aktiebolag. Ink supply arrangement for ink jet printers. 3,967,286, Cl. 346-140.00R.
Ando, Soichi, to Tamura Electric Works, Ltd. Electromagnetic counters with mechanical actuated locking. 3,967,096, Cl. 235-92.00C.
Ando, Sumitoshi: *See—*
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Andoniev, Sergei Mikhailovich; Zilberman, Leonid Borisovich; Kudinov, Gennady Alexandrovich; Kutsykovich, Dorina Borisovna; Filipiev, Oleg Vladimirovich; Kasyanov, Grigory Ivanovich; Zalmanovich, Grigory Borisovich; and Raikovsky, Jury Borisovich. Apparatus for evaporative cooling of metallurgical plants. 3,966,179, Cl. 266-193.000.
Andre, Jacques Maurice Jules; van Thillo, Hugo Johannes; Lammers, Rene Odon; Debus, Henri Robert; and Cahen, Raymond Marc, to Labofina S.A. Process for preparing spheroidal alumina particles. 3,966,996, Cl. 423-626.000.
Andree, Hans; Koppensteiner, Gunther; and Stracke, Heinz-Ulrich, to Henkel & Cie G.m.b.H. N,N'-disubstituted thioureas, their process of production and use as antimicrobial agents. 3,966,968, Cl. 424-322.000.
Andrews, James R., to United States of America, Commerce. Tunnel diode pulse generator. 3,967,140, Cl. 307-286.000.
Andrews, John Frederick Collett; Beton, Roy Victor; Leavens, Kenneth David; and Scott, Gordon John, to Coal Industry (Patents) Limited. Lifting apparatus. 3,966,060, Cl. 214-35.00R.
Anglin, Russell E., to Oneida Electronics. Color brightness control. 3,967,314, Cl. 358-29.000.
Annen, Klaus: *See—*
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Anos, Alfredo M. Advertising device. 3,965,592, Cl. 40-28.100.
Ansted, Roger C.; and Rodgers, Gerald L., to Friedrich Refrigerators Inc. Refrigeration control circuit. 3,965,692, Cl. 62-193.000.
Antwerp Plastic Merchandising: *See—*
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Aoki, Atsushi; Fukuda, Rikiya; Nakayabu, Toshio; Ishibashi, Keijiro; Takeichi, Chiyoko; and Ishida, Mitsuo, to Sankyo Company Limited. Antibiotic substances B-41, their production and their use as insecticides and acaricides. 3,966,914, Cl. 424-122.000.
Aonuma, Masashi; Tamai, Yasuo; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Ferromagnetic powder for magnetic recording medium and method for preparation thereof. 3,966,510, Cl. 148-105.000.
Aoyagi, Yoshiaki: *See—*
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Apsit, Voldemar Voldemarovich; Sika, Zigurd Karlovich; and Kikust, Daniel Petrovich. Contactless synchronous electric machine. 3,967,145, Cl. 310-52.000.
Aquila, Werner; Himmele, Walter; Fliege, Werner; and Siegel, Hardo, to BASF Aktiengesellschaft. Production of 3-methylpentane-1,5-diol. 3,966,827, Cl. 260-635.00E.
Araga, Toshimi: *See—*
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ARFINA Anstalt fur Continentale und Vebersee-Finansinteressen: *See—*
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Ariga, Nagao: *See—*
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Ariyoshi, Junji; and Kariya, Noboru, to Arakawa Rinsan Kagaku Kogyo Kaisha; and Nard Institute. Novel resins and manufacturing the same. 3,966,485, Cl. 106-287.00R.

Ark-Les Switch Corporation: *See—*
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Armco Steel Corporation: *See—*
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Armour, Frank K.; and Winters, Robert P., to Interlake, Inc. Coke guide spray system. 3,966,563, Cl. 202-228.000.

Armour Pharmaceutical Company: *See—*
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Armstrong, Calvin N.: *See—*
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Arnaud, Nichole; and Bush, David Anthony, to Societe d'Assistance Technique pour Produits Nestle S.A. Alpha-galactosidase production. 3,966,555, Cl. 195-66.00R.

Arnold, Fred E.: *See—*
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ARP Instruments, Inc.: *See—*
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Arrighetti, Sergio; Brancaccio, Aldo; Cesca, Sebastiano; and Giuliani, Gianpaolo, to Snam Progetti S.p.A. Polymeric material having impact resistant properties and process for the preparation thereof. 3,966,844, Cl. 260-878.00R.

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Asahara, Yoshiyuki; Izumitani, Tetsuro; and Nakagawa, Kenji, to Hoya Glass Works, Ltd. Sealing method for laser glass. 3,966,448, Cl. 65-43.000.

Asahi-Dow Limited: *See—*
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Asakura, Toshiyuki; Itoga, Masaaki; Hayakawa, Takeshi; and Tanimura, Masamitu, to Toray Industries, Inc. Aromatic polyamide-type films. 3,966,686, Cl. 260-78.00A.

Asami, Hiroshi: *See—*
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Asano, Seiji, to Shimsei Kogyo Co., Ltd. Driving mechanism for traveling toy. 3,965,612, Cl. 46-211.000.

Ashe, John B.; Berry, Peter F.; and Hall, James D., to G. D. Searle & Co. Analyzing radiation from a plurality of sources. 3,967,120, Cl. 250-328.000.

Ashe, John B.; Berry, Peter F.; and Hall, James D., to G. D. Searle & Co. Radiation analyzer utilizing selective attenuation. 3,967,122, Cl. 250-367.000.

Ashland Oil, Inc.: *See—*
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Asinger, Friedrich; Offermanns, Heribert; Gluzek, Karl-Heinz; and vonBebenburg, Walter, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Resolution of D,L-protected-penicillamine. 3,966,752, Cl. 260-306.70C.

Asmus, Carl Junior, to Clayton Manufacturing Company. Roller brake tester. 3,965,731, Cl. 73-126.000.

Aspers, Arthur J.; and Finkelston, Robert J., to Standard Pressed Steel Co. Multi-stage tightening system. 3,965,778, Cl. 81-52.40R.

Aston, Jack Ralph; and Whitehouse, Ronald, to Joseph Gillott & Sons Limited. Pencil sharpeners. 3,965,949, Cl. 144-28.710.

Astra Pharmaceutical Products, Inc.: *See—*
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Ateliers Roannais de Constructions Textiles: *See—*
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Athanassiadis, Anthony, to Extraction de Smet. Apparatus for deodorizing oil and similar material. 3,966,559, Cl. 196-111.000.

Atkins, Thomas M., to Kelsey-Hayes Company. Skid control system. 3,966,266, Cl. 303-21.00P.

Atkinson, Alan W.; and Hodgson, Brian P., to Turner & Newall Limited. Fiberizable alkali-resistant E-type glass. 3,966,481, Cl. 106-54.000.

Atkinson, Joseph G.; and Luke, Michael O., to Merck Sharp & Dohme (I.A.) Corporation. Deuteration of functional group-containing hydrocarbons. 3,966,781, Cl. 260-410.90R.

Atlantic Richfield Company: *See—*
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Auborn, James J., to GTE Laboratories Incorporated. Electrochemical cell. 3,966,490, Cl. 136-6.0LN.

Aumann, Herbert M., to Wisconsin Alumni Research Foundation. Multimode and multistate ladder oscillator and frequency recognition device. 3,967,210, Cl. 331-56.000.

Auric Corporation: *See—*
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Austin-Berryhill, Inc.: *See—*
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Averitt, Marnie Carlton; and Bunnell, Edward Dennman, to AMP Incorporated. Circuit tester for three wire electrical outlets. 3,967,195, Cl. 324-51.000.

Avery, John R., to J. J. Avery, Inc. Identification device and method of making same. 3,965,598, Cl. 40-135.000.

AVM Corporation: *See—*
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Avramidis, Stellios Anthony, to FMC Corporation. Piggyback belt drive assembly. 3,965,764, Cl. 74-221.000.

Ayabe, Masaaki, to Sony Corporation. Method of making a single crystal intermetallic compound semiconductor. 3,966,881, Cl. 423-299.000.

Ayers, Ray R., to Shell Oil Company. Oil spill cleanup system. 3,966,614, Cl. 210-242.00R.

Azelkas, Walter G.: *See—*
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Babichev, Viktor Andreevich: *See—*
Novikov, Sergei Sergeevich; Khmelnitsky, Lenor Ivanovich; Lebedev, Oleg Vasilievich; Epishina, Lia Vladimirovna; Suvorova, Ljudmila Ivanovna; Lapshina, Lidia Vasilievna; Krylov, Valery Dmitrievich; Zaikonnikova, Irina Vitalievna; Zimakova, Irina Evgenievna; Chudnovsky, Vladimir Sergeevich; Babichev, Viktor Andreevich; and Avdonina, Nina Alexandrovna, 3,966,742.

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Bader-Ludwig, Dagmar, legal representative: *See—*
Beriger, Ernst; Kristiansen, Odd; Rufenacht, Kurt; and Bader, Jorg, deceased, 3,966,921.

Baer, John S., to Warner Electric Brake & Clutch Company. Helical spring clutch. 3,966,024, Cl. 188-71.200.

Baeyens, Freddy Carolus: *See—*
Van Poucke, Raphael Karel; and Baeyens, Freddy Carolus, 3,966,475.

Baganz, Horst; and May, Hans-Joachim, to A. Nattermann & Cie GmbH. Imidazoline derivatives and processes for the production thereof. 3,966,757, Cl. 260-309.600.

Bagg, Greville Euan Gordon; and Cracknell, Robert Ian, to National Research Development Corporation. Apparatus for the measurement of viscosity. 3,965,722, Cl. 73-59.000.

Baile, Clifton A.; Gallagher, Gregory; McLaughlin, Carol Lynn; and Webb, Robert Lee, to SmithKline Corporation. Methods and compositions for increasing feed intake of animals. 3,966,958, Cl. 424-300.000.

Bailey, Donald Leroy: *See—*
Johnson, Gordon Carlton; Metzler, Richard Bruce; and Bailey, Donald Leroy, 3,967,030.

Bailey, Edward A.; and Ordway, James F., to Joy Manufacturing Company. Drill steel. 3,966,341, Cl. 403-343.000.

Bailey Meters & Controls Ltd.: *See—*
deVial, Raymond Michael, 3,965,920.

Baker, Bill; and Patterson, Frank. Newsprint rewinder. 3,966,135, Cl. 242-58.100.

Baker, Don R.; Walker, Francis H.; and Letchworth, Peter E., to Stauffer Chemical Company. Insect repellent compounds. 3,966,806, Cl. 260-558.00R.

Baker, Don R.; Walker, Francis H.; and Letchworth, Peter E., to Stauffer Chemical Company. Insect repellent compounds. 3,966,809, Cl. 260-559.00R.

Baker, Edward D., to N.P.I. Corporation. Sliding patty griller. 3,965,807, Cl. 99-375.000.

Baker, Larry K. Reduced liquid consumption cleaning apparatus. 3,965,494, Cl. 4-145.000.

Bakker, Lubertus, to Meyers, Joseph P., a part interest. Method of preparing and isolating metal hydrocarbonyls and recovery of pure metals therefrom. 3,966,886, Cl. 423-417.000.

Balassa, Leslie L., to Lescarden Ltd. Method of treating degenerative joint afflictions. 3,966,908, Cl. 424-95.000.

Balban, Morton S.; and Larson, Doublas A., to Eaton Corporation. Acceleration change sensor. 3,967,135, Cl. 307-121.000.

Ball Corporation: *See—*
Dollar, David L., 3,966,505.

Ballman, Richard L.; Lea, Kenneth R.; Nunning, Walter J.; and Southern, John H., to Monsanto Company. Polyurethane fiber uniformity. 3,966,866, Cl. 264-171.000.

Ballu, Vincent Pierre Marie, to Tecnoma. Manually operated manportable sprayer. 3,966,092, Cl. 222-175.000.

Balzer, Gerry Christian, to Bell Telephone Laboratories, Incorporated. Call denial circuit for key telephone systems. 3,967,076, Cl. 179-99.000.

Bane, John D.: *See—*
Beam, John A.; and Bane, John D., 3,966,221.

Banks, Geoffrey Talbot: *See—*
Chain, Ernst Boris; Buck, Kenneth William; Darbyshire, Joan Elizabeth; Banks, Geoffrey Talbot; Himmelweit, Fred; and Ratti, Giulio, 3,966,707.

Banks, Philip George; and Pringle, William, to British Arkady Company Limited, The. Treatment of soya. 3,966,992, Cl. 426-583.000.

Banner, Kurt A., to Mekantransport AB. Device for the removal of maculature or similar. 3,966,545, Cl. 162-264.000.

Barber-Greene Company: *See—*
Day, Earl G., 3,967,271.

Barber, Sidney: *See—*
Abrams, Ellis; and Barber, Sidney, 3,965,712.

Barber, Theodore C. Leaf cutter bee larvae extracting device. 3,965,509, Cl. 6-12.00A.

Bardot, Pierre, to Sucmanu. Conveyors. 3,965,823, Cl. 104-91.000.

Bargain, Michel, to Rhone-Poulenc Industries. Compositions containing silanes possessing imide groups. 3,966,531, Cl. 156-329.000.

Barger, Frank L.: *See—*
Harrison, Charles W.; Mead, Theodore C.; Moreland, Howard R.; and Barger, Frank L., 3,965,723.

Barnes-Hind Pharmaceuticals, Inc.: *See—*
Nite, Rebecca F., 3,966,905.

Barnhardt, J. David, to Southern Webbing Mills. Warp knitted compression bandage fabric. 3,965,703, Cl. 66-193.000.

Barracudaverken Aktiebolag: *See—*
Dalblom, Gunnar, 3,967,026.

Barrett, James Henry; and Clemens, David Henry, to Rohm and Haas Company. Method of decolorizing sugar solutions with hybrid ion exchange resins. 3,966,489, Cl. 127-46.00A.

Barrus, Donald Martin, to Combustion Engineering, Inc. Scram release for a control rod. 3,965,757, Cl. 74-30.000.

Barry, Gerald E.: *See—*
Kanengieter, Glenn G.; and Barry, Gerald E., 3,965,660.

Barth, John W., to Allis-Chalmers Corporation. Mechanism for loader bucket or forklift mast on a material handling vehicle. 3,966,070, Cl. 214-776.000.

Barth, Wayne E., to Pfizer Inc. 4-(Tetrazol-5-yl)-Δ^3-cephem compounds. 3,966,719, Cl. 260-243.00C.

Bartlett, James E.: *See—*
Gelin, Robert J.; and Bartlett, James E., 3,966,132.

Barton, David W., to Ford Motor Company. Heater tube arrangements. 3,965,976, Cl. 165-175.000.

Basa, Kenneth B.: *See—*
Levinson, Arthur A.; and Basa, Kenneth B., 3,966,977.

BASF Aktiengesellschaft: *See—*
Aquila, Werner; Himmele, Walter; Pliege, Werner; and Siegel, Hardo, 3,966,827.
Diem, Hans; Dudeck, Christian; and Lehmenn, Gunter, 3,966,727.
Fischer, Adolf, deceased, 3,966,451.
Fischer, Adolf, deceased, 3,966,452.
Kovacs, Jenoe; Jung, Hans; Marx, Matthias; Spoor, Herbert; and Roschke, Wilfried, 3,966,655.
Langenfelder, Hans; Daubach, Ewald; and Belde, Horst, 3,966,488.
Mangold, Dietrich; Zeeh, Bernd; and Pommer, Ernst-Heinrich, 3,966,750.
Nebel, Hans-Joachim, 3,966,402.

BASF Wyandotte Corporation: *See—*
Patton, John T., Jr.; Pizzini, Louis C.; Demou, John G.; and Ramlow, Gerhard G., 3,966,521.

Basili, Pietro: *See—*
Rossi, Umberto; and Basili, Pietro, 3,967,205.

Bathellier, Andre; and Germain, Michel, to Commissariat a l'Energie Atomique. Method of preparation of hydroxylamine formiate. 3,966,804, Cl. 260-542.000.

Batz, James E., to Northern Illinois Gas Company. Data transmission system including an RF transponder for generating a broad spectrum of intelligence bearing sidebands. 3,967,202, Cl. 325-31.000.

Bauer, Benjamin B., to CBS Inc. Logic for matrix systems for reproducing quadraphonic sound. 3,967,063, Cl. 179-1.0GQ.

Bauer, Fritz: *See—*
Stadelmann, Ludwig; and Bauer, Fritz, 3,966,182.

Bauer, Ronald S.: *See—*
Jenkins, John W.; Bauer, Ronald S.; and De La Mare, Harold E., 3,966,636.

Bauer, Werner R., to Robertshaw Controls Company. Electrical switch construction. 3,967,086, Cl. 200-328.000.

Bauerle, Richard D.; Pitt, William A.; and White, Mervyn A., to General Electric Company. Pipe restraint device. 3,965,938, Cl. 138-107.000.

Baxter Laboratories, Inc.: *See—*
Cayle, Theodore; and Moskowitz, Gerard J., 3,966,543.
Marcus, Byron E., 3,966,333.
Osiadacz, William J.; and Nagy, Alexander J., 3,965,536.
Soodak, Charles; and Macemon, James H., 3,967,113.

Baxter, Lawson J., to Armco Steel Corporation. Apparatus for producing a uniform metallic coating on wire. 3,965,857, Cl. 118-405.000.

Bayer Aktiengesellschaft: *See—*
Beck, Gunther, 3,966,812.
Bleck, Wolf-Eckhard; Nickel, Horst; and Schundehutte, Karl-Heinz, 3,966,703.
Bossert, Friedrich; and Vater, Wulf, 3,966,948.
Christoph, Geert; Radlmann, Eduard; Nischk, Gunther; Bruns, Ludwig; and Schnuchel, Gunther, 3,966,835.
de Cleur, Eckhard; Dhein, Rolf; Rudolph, Hans; and Kreuder, Hans Joachim, 3,966,836.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lother; Behrenz, Wolfgang; Hammann, Ingeborg; Stendel, Wilhelm; and Homeyer, Bernhard, 3,966,730.
Immel, Otto; and Schwarz, Hans-Helmut, 3,966,712.
Kleiner, Frank Gerald; and Muller, Karl Heinz, 3,966,651.
Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, 3,966,709.
Krimm, Heinrich; Schnell, Hermann; and Schwarz, Hans-Helmut, 3,966,785.
Kurz, Jurgen; Kolling, Heinrich; and Federmann, Manfred, 3,966,964.
Merten, Rudolf; Lewalter, Jurgen; and Zecher, Wilfried, 3,966,683.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,966,767.
Reisdorff, Josef Helmut; Aichinger, Gerd; Haberkorn, Axel; Kolling, Heinrich; and Kranz, Eckart, 3,966,725.
Riebel, Hans-Jochem; and Hammann, Ingeborg, 3,966,850.
Riebel, Hans-Jochem; Hammann, Ingeborg; and Stendel, Wilhelm, 3,966,920.
Westphal, Kurt; Meiser, Werner; Eue, Ludwig; and Hack, Helmuth, 3,966,715.
Witte, Josef; and Lehnert, Gunther, 3,966,637.

Baylac, Bernard; Merckel, Gerard; and Meunier, Pierre, to Commissariat a l'Energie Atomique. Amplifying integrated circuit in the MOS technology. 3,967,208, Cl. 330-35.000.

BBC Brown Boveri & Company Limited: *See—*
Iten, Paul D., 3,966,324.
Zboril, Josef, 3,966,511.

Beach, David Easton, to Eastman Kodak Company. Piezoelectric crystal firing spring and mount. 3,967,142, Cl. 310-8.300.

Beam Guidance Inc.: *See—*
Goubau, George E. J., 3,967,276.

Beam, John A.; and Bane, John D., to Hoechst Fibers Incorporated. Yarn shipping rack assembly. 3,966,221, Cl. 280-79.300.

Bean, Anthony J., to Sun Chemical Corporation. Photopolymerization co-initiator systems. 3,966,573, Cl. 204-159.230.

Bean, Lloyd F., to Xerox Corporation. Multiple layer migration imaging system. 3,966,465, Cl. 96-1.0PS.

Bear Co. Ltd: *See—*
Kodera, Yoshinobu, 3,965,671.

Beard, Franklin. Golf club bending machine for setting the loft and lie angles of the club head. 3,965,714, Cl. 72-32.000.

Beath, Laurence R.; and Vessic, Alexander M., to Price Company Limited, The. Frozen fish package. 3,967,024, Cl. 428-155.000.

Beaty, William Ralph, Jr., to Continental Oil Company. Catalytic hydrodesulfurization. 3,966,588, Cl. 208-216.000.

Beaudin, Patrick L. Air duct made from sheet metal stamping. 3,965,933, Cl. 137-610.000.

Beaulieu, Maurice. Footwear and attachment assembly for snowshoeing. 3,965,584, Cl. 36-122.000.

Beaver, Ruby C.; Clasen, Theodor; Henning, Wolfgang; and Johnson, Emil S., to Vetco Offshore Industries. Method for flaw location in a magnetizable pipeline by use of magnetic markers positioned outside of said pipeline. 3,967,194, Cl. 324-37.000.

BEC Products, Inc.: *See*—
Dageford, Ernest C., 3,967,281.

Beck, Gary R.: *See*—
Intille, George M.; and Beck, Gary R., 3,966,798.

Beck, Gunther, to Bayer Aktiengesellschaft. Trichloroethylidene-bis-(isocyanide-dichloride) and process for making same. 3,966,812, Cl. 260-566.00D.

Becker, Kenneth W.; Baczewski, Klemens C.; and Klein, Donald J., to Dravo Corporation. Process and apparatus for treating oleaginous seed material. 3,966,982, Cl. 426-430.000.

Becker, Manfred, to AGFA-Gevaert, A.G. Spectrally sensitized silver halide emulsion containing more than 50% of the grains with ripening nuclei in cavities. 3,966,476, Cl. 96-107.000.

Becker, Theo; Hilscher, Eduard; and Ott, Karl-Heinz, to Hoechst Aktiengesellschaft. Flexible container for wine and fruit-juice. 3,965,953, Cl. 150-3.000.

Becton, Dickinson and Company: *See*—
Shotkin, Robert, 3,965,848.

Beduchaud, Michel; and Ramadier, Andre, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Device for loading and unloading a sheet on a rotating drum. 3,966,187, Cl. 271-3.000.

Beecham Group Limited: *See*—
Brain, Edward George; and Osborne, Neal Frederick, 3,966,718.
Chain, Ernst Boris; Buck, Kenneth William; Darbyshire, Joan Elizabeth; Banks, Geoffrey Talbot; Himmelweit, Fred; and Ratti, Giulio, 3,966,707.
Forward, Geoffrey Charles; Duke, Susan Ann; and Bell, Melissa Anne, 3,966,863.

Beeferman, Dennis: *See*—
Esemplare, Pascal E.; and Beeferman, Dennis, 3,967,014.

Beerwerth, Wolfgang; Geppert, Albrecht; Gesing, Horst; and Schimmer, Rigobert, to Licentia Patent-Verwaltungs-G.m.b.H. Method for producing diffused contacted and surface passivated semiconductor chips for semiconductor devices. 3,965,567, Cl. 29-574.000.

Begany, Albert J.: *See*—
Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 3,966,965.

Behn, Robert M.: *See*—
Weir, Henry John, 3,965,831.

Behn, Sheldon P.: *See*—
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Behrenz, Wolfgang: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lother; Behrenz, Wolfgang; Hammann, Ingeborg; Stendel, Wilhelm; and Homeyer, Bernhard, 3,966,730.

Behringwerke Aktiengesellschaft: *See*—
Beltz, Heinrich, 3,965,864.
Schultze, Hermann E.; and Schwick, Hans Gerhard, 3,966,906.

Beiersdorf Aktiengesellschaft: *See*—
Muller, Heinz; Szonn, Bodo; Jauchen, Peter; and Schulze, Rolf, 3,967,028.

Beierwaltes, Richard R. Compressor and air cooling system employing same. 3,965,697, Cl. 62-402.000.

Bekker, Gijsbertus A.: *See*—
Groenendaal, Willem; Taubert, Friedrich C.; Naber, Jaap E.; and Bekker, Gijsbertus A., 3,966,879.

Belde, Horst: *See*—
Langenfelder, Hans; Daubach, Ewald; and Belde, Horst, 3,966,488.

Belisle, Adelard J., to Dual Manufacturing and Engineering Incorporated. Rocker spring unit. 3,966,251, Cl. 297-267.000.

Belke, Carl F., to Belke, David P., a part interest. Bicycle lock. 3,965,709, Cl. 70-227.000.

Belke, David P.: *See*—
Belke, Carl F., 3,965,709.

Bell, Arthur Milton. Lubricant for fitting and trial mounting of prosthodontic appliances. 3,966,925, Cl. 424-240.000.

Bell & Howell Company: *See*—
Grant, Frederic F., 3,966,190.
Hadzimahalis, Theodore M., 3,965,529.
Spencer, William H., 3,967,188.
Stocker, Lester H., 3,965,644.
Woodier, James G., 3,966,313.

Bell, Melissa Anne: *See*—
Forward, Geoffrey Charles; Duke, Susan Ann; and Bell, Melissa Anne, 3,966,863.

Bell Telephone Laboratories, Incorporated: *See*—
Anderson, Harold Peter; Lesser, George Albert; Lukas, Fredric; Maxon, Rodney Robert; and Viamour, James Hall, 3,967,073.
Balzer, Gerry Christian, 3,967,076.
Dimmick, James Owen; Lewis, Theras Gordon; O'Neill, John Francis; and Fabiano, Lucian Philip, Jr., 3,967,072.
House, Frederick Glenn, 3,967,246.
Judice, Charles Norris, 3,967,052.
Knowlton, Kenneth Charles, 3,967,273.
Krambeck, Robert Harold, 3,967,136.
Mathes, Robert C., 3,967,066.
Miller, Stewart Edward, 3,966,446.
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O'Sullivan, Thomas Denis, 3,966,494.
Potter, Ralph K., 3,967,067.
Schillo, Robert Frederick, 3,967,074.
Subramanian, Mahadevan, 3,967,060.

Bellak, Johannes G. Laser reactor. 3,967,215, Cl. 331-94.50R.

Bellarbre, Raymond; and Legavre, Marcel, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Automatic play take-up journal bushings. 3,966,276, Cl. 308-238.000.

Beltz, Heinrich, to Behringwerke Aktiengesellschaft. Automatic device for the maintenance of small animals. 3,965,864, Cl. 119-18.000.

Bemis Manufacturing Company: *See*—
Bemis, Richard A., 3,965,493.

Bemis, Richard A., to Bemis Manufacturing Company. Water closet tank. 3,965,493, Cl. 4-18.00R.

Bencic, Robert S., to Eaton Corporation. Carbonated beverage dispenser having diffuser assembly. 3,966,091, Cl. 222-129.100.

Bender, Louis, to Brenner and Bender, Inc. Specimen collector and holder. 3,965,888, Cl. 128-2.00W.

Bendler, Hellmut: *See*—
Gawlick, Heinz; Brede, Uwe; and Bendler, Hellmut, 3,967,141.

Benjamin, Milton L., to Erickson Tool Company. Spade drill. 3,966,350, Cl. 408-233.000.

Bennett, Allan Igo, to Westinghouse Electric Corporation. Method and apparatus for measuring the void content of a solid dielectric. 3,967,196, Cl. 324-54.000.

Bennett, Derek J.; and Bullen, Leslie G., to Bunker Ramo Corporation. Precise navigation buoy. 3,965,512, Cl. 9-8.00R.

Bennett, Duane C.: *See*—
Schneller, Joseph W.; Bennett, Duane C.; and Matiacio, George P., 3,967,016.

Bennett, John D., to Sun Oil Company. Arctic transport and marine operation system. 3,965,835, Cl. 114-42.000.

Bennon, Saul; and Albright, William D., to Westinghouse Electric Corporation. Electrical inductive apparatus having magnetic shielding cores and a gapped main core structure. 3,967,226, Cl. 336-84.000.

Benson Mfg. Corporation: *See*—
Littman, Bruce A., 3,966,121.

Benton, Ronald E., to Westinghouse Electric Corporation. Adaptor for transformer bushing terminals. 3,966,294, Cl. 339-153.000.

Berger, Herbert; Rhomberg, Alfred; Stach, Kurt; Vomel, Wolfgang; and Sauer, Winfriede, to Boehringer Mannheim G.m.b.H. Ortho fused cycloalkano-4-quinolone-3-carboxylic acid derivatives. 3,966,743, Cl. 260-287.0CF.

Berghof, Hans-Joachim; Hacklander, Hans-Gerd; and Klingelhofer, Gerd, to Keiper KG. Vehicle seat with tiltable backrest. 3,966,253, Cl. 297-367.000.

Bergstrand, Carl Gunnar, to Allmanna Svenska Elektriska Aktiebolaget. Apparatus for electroinductively detecting discontinuities below the surface of a metal object. 3,967,193, Cl. 324-37.000.

Beriger, Ernst; Kristiansen, Odd; Rufenacht, Kurt; and Bader, Jorg, deceased (by Bader-Ludwig, Dagmar, legal representative), to Ciba-Geigy Corporation. Certain pesticidal phosphorus containing amidines. 3,966,921, Cl. 424-211.000.

Berman, Paul A.: *See*—
Yasui, Robert K.; and Berman, Paul A., 3,966,499.

Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, to American Cyanamid Company. 2-Substituted-3,4-epoxycyclopentan-1-ones, and 2-substituted-3,4-epoxycyclopentan-1-ols. 3,966,773, Cl. 260-348.00C.

Bernardi, Luigi; Bosisio, Germano; and Fregnan, Gian Carlo, to Societa' Farmaceutici Italia S.p.A. Pyrrole-carboxylic acids lumilysergol esters. 3,966,739, Cl. 260-285.500.

Bernardis, Francesco; and Bisone, Dario, to Ing. C. Olivetti & C., S.p.A. Inked ribbon feed arrangement. 3,966,036, Cl. 197-82.000.

Bernsee, Gerhard, to Jenaer Glaswerk Schott & Gen. Light conducting fibers of quartz glass. 3,966,300, Cl. 350-96.00B.

Berrange, Aubrey Ralph, to South African Inventions Development Corporation. Compactor. 3,966,346, Cl. 404-124.000.

Berry, Peter F.: *See*—
Ashe, John B.; Berry, Peter F.; and Hall, James D., 3,967,120.
Ashe, John B.; Berry, Peter F.; and Hall, James D., 3,967,122.

Berry, Thomas: *See*—
Ferrier, Duncan Cameron; Berry, Thomas; and Murenbeeld, Karel, 3,965,547.

Berryhill, Robert A., to Austin-Berryhill, Inc. Air washer piping. 3,965,690, Cl. 62-121.000.

Bert, George J.; Stehle, Edward J.; and Groth, Herbert D. Power transmission unit. 3,965,773, Cl. 74-804.000.

Bertram, Wallace H., to Goode Products, Inc. Folding cot. 3,965,502, Cl. 5-111.000.

Berzanske, Lawrence W. Rotary, positive displacement progressing cavity device. 3,966,371, Cl. 418-197.000.

Beson, John, to McEvoy Oilfield Equipment Co. Control line exiting coupling. 3,965,977, Cl. 166-88.000.

Besser, Roy: *See*—
Norton, Dale H., 3,966,085.

Bethlehem Steel Corporation: *See—*
Townsend, Herbert E., Jr.; Horton, James B.; and Woodyatt, Louis R., 3,966,421.

Beton, Roy Victor: *See—*
Andrews, John Frederick Collett; Beton, Roy Victor; Leavens, Kenneth David; and Scott, Gordon John, 3,966,060.

Beyer, Fritz: *See—*
Scharrer, Werner; and Beyer, Fritz, 3,967,167.

Beyer-Olsen, Knut; and Steffenssen, Otto. Machines for rotational moulding of plastic articles with article removal means. 3,966,386, Cl. 425-436.00R.

Beyl, Jean Joseph Alfred. Ski binding with incorporated boot supporting pivoting plate. 3,966,218, Cl. 280-618.000.

Bharucha, Kekhusroo R.; Cross, Charles K.; and Rubin, Leon J., to Canada Packers Limited. Curing of meat using organic nitrites. 3,966,974, Cl. 426-265.000.

Bickford, Richard A. Resistance type golf swing practice and exercise device. 3,966,203, Cl. 272-118.000.

Bier, Gerhard: *See—*
Frick, Siegmund; Gresser, Wilhelm; Meyer, Gunther; and Bier, Gerhard, 3,966,673.

Biffle, Morris S., to Dresser Industries, Inc. Method of sealing the annulus between a toolstring and casing head. 3,965,987, Cl. 166-315.000.

Big Dutchman (International) A.G.: *See—*
van den Berg, Christiaan, 3,966,049.

Bigelow-Sanford, Inc.: *See—*
Stunger, Edward R., 3,965,575.

Bindrum, Irmgard: *See—*
Brandt, Wilhelm; and Bindrum, Irmgard, 3,967,044.

Binger, Bernhard, to Zahnradfabrik Friedrichshafen AG. Compound steering system for endless-track vehicles. 3,966,005, Cl. 180-6.440.

Bingler, Donald J. Fishing lure. 3,965,606, Cl. 43-42.160.

Binninger, Clarence E. Methods for inducing parturition in cattle with certain intravenously-injected synthetic glucocorticoids. 3,966,927, Cl. 424-243.000.

Binns, Robert Eric, to Amchem Products, Inc. Zirconium rinse for phosphate coated metal surfaces. 3,966,502, Cl. 148-6.000.

Bio-Logics Products, Inc.: *See—*
McDermott, Clifton Eugene, 3,965,589.

Bio-Medical Sciences, Inc.: *See—*
Khattab, Ghazi; and Witonsky, Robert J., 3,966,414.

Bird, Arnett L.: *See—*
Ludwig, Peter J.; and Bird, Arnett L., 3,966,842.

Bird Machine Company, Inc.: *See—*
Gibbs, Orville J., 3,966,610.
Gibbs, Orville J.; and Roos, John T., 3,966,611.

Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, to Hoechst Aktiengesellschaft. Process and device for the irregular dyeing of textiles. 3,966,400, Cl. 8-82.000.

Bisone, Dario: *See—*
Bernardis, Francesco; and Bisone, Dario, 3,966,036.

Bittel, Patricia A., to Weatherchem Corporation. End closure with resealable tab. 3,966,080, Cl. 220-269.000.

Bittensky, Joel S.; Dillingham, Edward W.; Menzies, William R., III; and Pratt, Roy E., to Texaco Inc. Method for controlling regenerator temperature in a fluidized cracking process. 3,966,587, Cl. 208-164.000.

Biviator S.A.: *See—*
Strutz, Ernst, 3,967,124.

Bizerba-Werke Wilhelm Kraut K.G.: *See—*
Muller, Ernst; and Maurer, Albrecht, 3,965,783.

BJ-Hughes Inc.: *See—*
Kelly, Robert R., 3,966,054.

Black, Edgar R.; Montagna, Angelo A.; and Swift, Harold E., to Gulf Research & Development Company. Hydrocarbon conversion catalyst. 3,966,642, Cl. 252-455.00R.

Blair, Bryce Wilson: *See—*
Lockard, Joseph Larue; and Blair, Bryce Wilson, 3,967,085.

Blake, Charles William, to McCorquodale Colour Display Limited. Method for applying liquid to a substrate. 3,967,009, Cl. 427-256.000.

Blaupunkt-Werke GmbH: *See—*
Hansen, Jens, 3,967,204.

Bleck, Wolf-Eckhard; Nickel, Horst; and Schundehutte, Karl-Heinz, to Bayer Aktiengesellschaft. Asymmetrical frisazo dyestuffs derived from diazotized 2,7-diamino-carbazole. 3,966,703, Cl. 260-146.00R.

Bleiberg, Melvin L.: *See—*
Foulds, Ronald B.; Kasberg, Alvin H.; Puechl, Karl H.; and Bleiberg, Melvin L., 3,966,550.

Bloomfield, Rodger E., to General Motors Corporation. Catalytic converter having monolith with mica support means therefor. 3,966,419, Cl. 23-288.00F.

Blue, James W., to United States of America, National Aeronautics and Space Administration. Method of producing ^{125}I. 3,966,547, Cl. 176-11.000.

Blue Wing Corporation: *See—*
Rawlings, Robert M.; and Maher, Anthony Ambrose, 3,966,998.

Blum Gesellschaft m.b.H.: *See—*
Rock, Erich; and Mages, Bernhard, 3,965,530.

Blumberg, Jonathan Mark, to Gec-Elliott Automation Limited. Methods and apparatus for controlling the propulsion of aquatic vessels incorporating such apparatus. 3,965,840, Cl. 114-144.00B.

Blunt, Geoffrey Vincent Dallow; and Hodges, Newton John, to Coal Industry (Patents) Limited. Cellular material. 3,966,653, Cl. 260-2.5EP.

Boarini, Edward J., to United States Gypsum Company. Beam-reinforced ceiling panels. 3,965,639, Cl. 52-629.000.

Boden, Ogden W. Locking device with combined wedging and spring action. 3,965,544, Cl. 24-136.00R.

Bodor, Nicolae S.; and Yuan, Sun-Shine, to Interx Research Corporation. Novel synthesis of optically active m-acyloxy-α-[(methylamino)methyl]benzyl alcohols, the pharmaceutically acceptable acid addition salts thereof and intermediate useful in the preparation thereof. 3,966,749, Cl. 260-295.00R.

Bodor, Nicolae S.: *See—*
Kaminski, James J.; and Bodor, Nicolae S., 3,966,796.

Boedecker, Steven M., to Kendall Company, The. Anti-reflux device. 3,965,900, Cl. 128-275.000.

Boehringer Ingelheim GmbH: *See—*
Schromm, Kurt; Mentrup, Anton; Renth, Ernst-Otto; and Traunecker, Werner, 3,966,814.

Boehringer Mannheim G.m.b.H.: *See—*
Berger, Herbert; Rhomberg, Alfred; Stach, Kurt; Vomel, Wolfgang; and Sauer, Winfriede, 3,966,743.
Kampe, Wolfgang; Fauland, Erich; Stach, Kurt; Stork, Harald; and Schmidt, Felix Helmut, 3,966,916.

Boeing Company, The: *See—*
Buehler, Walter E.; and Fitzsimmons, George W., 3,967,278.
Wiesner, Robert, 3,966,145.
Wittko, Joseph N.; Harding, David G.; Schneider, John J.; and Gonsalves, Joseph E., 3,966,147.

Bogart, James S.; and Wilcox, John M., to Federal-Mogul Corporation. Device for determining the size dash number of standard O-rings. 3,965,580, Cl. 33-143.00M.

Bohm, Bernhard: *See—*
Muller, Klaus; and Bohm, Bernhard, 3,966,548.

Bohner, Beat; Dawes, Dag; Meyer, Willy; Kristinsson, Haukur; and Rufenacht, Kurt, to Ciba-Geigy Corporation. Certain sulfonic acid esters. 3,966,754, Cl. 260-308.00R.

Boigk, Dieter G.: *See—*
Shelton, Lawrence S.; Golsch, Rudolf A. M.; and Boigk, Dieter G., 3,966,042.

Bokern, James F. Power supply means. 3,967,133, Cl. 307-10.00R.

Bolduc, Lee R. Cutting apparatus. 3,965,569, Cl. 30-29.500.

Boler, Leonard J., to Cherne Industrial, Inc. Multiple stage liquid cooling assembly. 3,966,859, Cl. 261-92.000.

Boltze, Karl-Heinz; Brendler, Otfried; Dell, Hans-Dieter; and Jacobi, Haireddin, to Troponwerke Dinklage & Company. [1-(p-Chlorobenzoyl)-5-methoxy-2-methyl-3-indole]acetoxyacetic acid and salts in treating inflammation. 3,966,956, Cl. 424-274.000.

Bombardier Limited: *See—*
Gowing, George A., 3,966,014.
Lessard, Normand, 3,966,181.

Bommer Spring Hinge Co. Inc.: *See—*
Frohlich, Peter E., 3,965,533.

Bonavent, Gerard; and Huvey, Michel, to Institut Francais du Petrole. Device for continuously manufacturing curved profiled members of plastic material reinforced with filaments. 3,966,388, Cl. 425-505.

Boni, Miklos. Folding bed assembly. 3,965,498, Cl. 5-6.000.

Booher, Claude R., Jr.; and Rahaim, Thomas J., to Westinghouse Electric Corporation. Ceramic-to-metal (or ceramic) cushion/seal for use with three piece ceramic stationary vane assembly. 3,966,353, Cl. 415-115.000.

Boom, Roger W.; Eyssa, Yehia M.; and Sutton, John, to United States of America, Interior. Magnetic ore separator. 3,966,590, Cl. 209-39.000.

Boone, Jerry S.: *See—*
Amos, Lynn G.; and Boone, Jerry S., 3,967,109.

Borden, Inc.: *See—*
Williams, Murray John, 3,966,970.

Borowiec, Richard A.: *See—*
Thomas, Howard M.; and Borowiec, Richard A., 3,965,791.

Borst, Lyle Benjamin. Photographic process. 3,967,117, Cl. 250-323.000.

Boser, Ernst: *See—*
Schneider, Heinrich; and Boser, Ernst, 3,966,395.

Bosisio, Germano: *See—*
Bernardi, Luigi; Bosisio, Germano; and Fregnan, Gian Carlo, 3,966,739.

Bossert, Friedrich; and Vater, Wulf, to Bayer Aktiengesellschaft. Spasmolytic, vaso-dilating and anti-hypertensive compositions and methods. 3,966,948, Cl. 424-266.000.

Bossert, Friedrich: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,966,767.

Boubel, Richard W.; Babler, David C.; and Peter, Donald W., to Rader Companies, Inc. Apparatus for automatically measuring particulate emissions in gas flow. 3,965,748, Cl. 73-421.50A.

Bouguyon, Gerard: *See—*
Lavigne, Jean; Chesnel, Pierre; and Bouguyon, Gerard, 3,965,993.

Bould, Fred; and Davies, Norman, to Westinghouse Electric Corporation. Method and apparatus for aligning and affixing portions of circuit breaker apparatus. 3,967,083, Cl. 200-237.000.

Boundy, Bruce K., to Westinghouse Electric Corporation. Cantilever lock. 3,966,158, Cl. 248-243.000.

Bowcott, Roy Price, to Lucas Electrical Company Limited, The. Roller clutch assembly. 3,965,754, Cl. 74-6.000.

Bower, Robert W., to TRW Inc. Asymmetrical well charge coupled device. 3,967,306, Cl. 357-24.000.

Bowman, Henry Torrens A.: *See—*
Webster, John David; and Bowman, Henry Torrens A., 3,965,555.

Box, Theodor. Latch for a poultry transport cage. 3,966,084, Cl. 220-326.000.
Boyd, Alfred Kent, to Texas Instruments Incorporated. Inertia isolator. 3,966,108, Cl. 226-114.000.
Boynton, Kenneth G., to Hollis Engineering, Inc. Stabilizer system with ultrasonic soldering. 3,966,110, Cl. 228-175.000.
Braaten, Terje, to Engell, Renee. Apparatus for manufacturing sleeves from fiber pulp. 3,966,546, Cl. 162-293.000.
Brabo Corporation Naamloze Vennootschap: *See*—
Den Ouden, Alfons Adriaan, 3,965,610.
Bracken, Joseph W., Jr., to Eaton Corporation. Spring compensated radially flexible power takeoff shaft. 3,965,699, Cl. 64-1.00V.
Bradley, John G. Golf tee device. 3,966,213, Cl. 273-201.000.
Bradshaw, Janice: *See*—
Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, 3,966,717.
Brain, Edward George; and Osborne, Neal Frederick, to Beecham Group Limited. 7-β-Acylamino-ceph-3-ems and salts and esters therefor. 3,966,718, Cl. 260-243.00C.
Braithwaite, David G.; and Allain, Ronald J., to Nalco Chemical Company. Anhydrous magnesium chloride using ethylene glycol and ammonia. 3,966,888, Cl. 423-498.000.
Brancaccio, Aldo: *See*—
Arrighetti, Sergio; Brancaccio, Aldo; Cesca, Sebastiano; and Giuliani, Gianpaolo, 3,966,844.
Brandt, Burkhard A., to Sola Basic Industries, Inc. Mounting strap. 3,967,049, Cl. 174-53.000.
Brandt, Wilhelm; and Bindrum, Irmgard, to Hoechst Aktiengesellschaft. Copper coatings on shaped plastic supports. 3,967,044, Cl. 428-457.000.
Branson Ultrasonics Corporation: *See*—
Fallenbeck, Eberhardt G.; and Upright, Wayne N., 3,966,520.
Brantingham, George L.; and Phillips, Louis H., to Texas Instruments Incorporated. Direct and indirect addressing in an electronic digital calculator. 3,967,104, Cl. 235-156.000.
Bratzler, Karl; and Doerges, Alexander, to Metallgesellschaft Aktiengesellschaft. Process for the desulfurization of gases. 3,966,875, Cl. 423-220.000.
Braun, Eugene R., to Eaton Corporation. Prestressed axle beam. 3,966,260, Cl. 301-127.000.
Braun, Oskar J., to Xerox Corporation. Plural cleaning rolls assembly. 3,966,394, Cl. 432-75.000.
Bray, Donald T., to Desalination Systems, Inc. Membrane cartridge. 3,966,616, Cl. 210-433.00M.
Breakthrough Research & Development Corporation: *See*—
Schneider, Henry Allen, 3,966,002.
Brede, Uwe: *See*—
Gawlick, Heinz; Brede, Uwe; and Bendler, Hellmut, 3,967,141.
Brendler, Otfried: *See*—
Boltze, Karl-Heinz; Brendler, Otfried; Dell, Hans-Dieter; and Jacobi, Haireddin, 3,966,956.
Brenner and Bender, Inc.: *See*—
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Brenner, L. Martin: *See*—
Van Hoeven, Helene E. Bowman; Brenner, L. Martin; and Loev, Bernard, 3,966,945.
Bresan, Lawrence A.: *See*—
Pearson, James R., 3,965,629.
Breschar, Klaus: *See*—
Plotz, Kurt; Breschar, Klaus; and Klein, Albert, 3,967,032.
Brescia, Riccardo: *See*—
Conta, Renato; Montanari, Lucio; and Brescia, Riccardo, 3,967,092.
Brewer, John C., to Garbalizer Corporation of America. Refuse processing equipment. 3,966,129, Cl. 241-79.100.
Briar, Thomas J.: *See*—
Schaefer, William L.; and Briar, Thomas J., 3,965,563.
Bridger, Robert F.; and Williams, Albert L., to Mobil Oil Corporation. Lubricant compositions. 3,966,620, Cl. 252-33.400.
Brinza, Joseph E.: *See*—
Stock, Arthur J.; Christofer, Donald E.; and Brinza, Joseph E., 3,966,175.
Brissette, Edward C.; and Smith, Edwin W., Jr. Shag rake attachment for upright vacuum cleaner. 3,965,525, Cl. 15-373.000.
Bristol-Myers Company: *See*—
Monkovic, Ivo; Saucier, Michel; Lambert, Yvon; and Montzka, Thomas Alfred, 3,966,747.
Pachter, Irwin J.; and Gordon, Maxwell, 3,966,940.
British Arkady Company Limited, The: *See*—
Banks, Philip George; and Pringle, William, 3,966,992.
British Broadcasting Corporation: *See*—
Fletcher, Russell Edward, 3,967,269.
Roberts, Allan, 3,967,268.
British Hovercraft Corporation Limited: *See*—
Crewe, Peter Rowland, 3,966,012.
British Petroleum Company Limited, The: *See*—
Lees, Byrom, 3,965,829.
Brixy, Heinz, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Temperature-measuring device. 3,966,300, Cl. 136-232.000.
Brock, John O.; Davis, Marmion Dean; and Wray, James Robert, to Interstate Industries, Inc. Apparatus for pivotally mounting a fishing motor. 3,965,844, Cl. 115-41.00R.
Bromberg, Menashe, to Thomas & Betts Corporation. Electrical receptacle. 3,966,152, Cl. 248-27.00R.
Brooks, William E., to Pravel & Wilson. Generator frequency converter. 3,967,185, Cl. 321-61.000.
Brotherton, Thomas Kemper: *See*—
Colomb, Henry Octave, Jr.; Trecker, David John; and Brotherton, Thomas Kemper, 3,966,797.
Brown, Eugene B., to Lawrence Peska Associates, Inc., a part interest. Traffic court board game. 3,966,211, Cl. 273-134.0GM.
Brown, George T., Jr., to NCR Corporation. Microform card including surface locating structure for elimination of Newton ring color banding and card utilization apparatus therefor. 3,966,314, Cl. 353-27.00R.
Brown, James L.: *See*—
Glovsky, Joel; and Brown, James L., 3,966,896.
Brown, John W., to Qantix Corporation. Transparent screen having intermittent portions for reducing reflection from ambient light. 3,966,301, Cl. 350-128.000.
Brown, Joseph F., to Raymond Lee Organization, Inc., The, a part interest. Paint applicator. 3,966,098, Cl. 222-413.000.
Brown, Lester E.; and West, Harry H., to University Engineers, Inc. Venting of cryogenic storage tanks. 3,965,689, Cl. 62-50.000.
Brown, Lester E.: *See*—
Wesson, Harold R.; Brown, Lester E.; and Puckett, Gregory L., 3,965,988.
Brown-Minneapolis Tank & Fabricating Co.: *See*—
Johnson, Leland L.; and Parkinson, Lindley A., 3,966,078.
Brown, Peter. Safety latch for trays. 3,966,159, Cl. 248-250.000.
Brown, Roger M., to Scientific Technology Incorporated. Pulsed light source discriminator system. 3,967,111, Cl. 250-206.000.
Brown & Root, Inc.: *See*—
Michael, Farid Y., 3,965,837.
Browning, Alva LaRoy, Jr. Electrostatic accelerometer and/or gyroscope radioisotope field support device. 3,965,753, Cl. 73-504.000.
Browning, Vernon D.: *See*—
Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., 3,966,104.
Brownlee, Kay Melinda: *See*—
Young, J. Ridgely, 3,967,240.
Brull, Maurice A.; and Arcan, Mircea, to Ramot University Authority for Applied Research & Industrial Development Ltd. Method and apparatus for indicating or measuring contact distribution over a surface. 3,966,326, Cl. 356-114.000.
Brunner, Manfred; and Knochenhauer, Horst, to H. Wolff Apparatebau K.G. Apparatus for boiling, cooking, steaming and sterilizing liquid, porridge-like or lumpy food. 3,965,806, Cl. 99-331.000.
Bruns, Ludwig: *See*—
Christoph, Geert; Radlmann, Eduard; Nischk, Gunther; Bruns, Ludwig; and Schnuchel, Gunther, 3,966,835.
Brunswick Corporation: *See*—
Fitzner, Arthur O., 3,965,879.
Brusa, Ugo. Composite block for refractory linings of furnaces. 3,965,637, Cl. 52-596.000.
Bryzinsky, Frank M.: *See*—
Grazen, Frank S.; Buike, Melvin L.; and Bryzinsky, Frank M., 3,966,670.
Bucher, Rene. Bed intended for use by sick and invalid persons. 3,965,501, Cl. 5-90.000.
Buck, Kenneth William: *See*—
Chain, Ernst Boris; Buck, Kenneth William; Darbyshire, Joan Elizabeth; Banks, Geoffrey Talbot; Himmelweit, Fred; and Ratti, Giulio, 3,966,707.
Buckner, Spencer P., to TRW Inc. Flapper valve with independent plate suspension. 3,965,926, Cl. 137-512.100.
Bucy, J. Fred, Jr., to Texas Instruments. Alarm system. 3,967,258, Cl. 340-258.00B.
Budd, Michael Keith: *See*—
Smith, Gordon Frederick; and Budd, Michael Keith, 3,966,619.
Buehler, Walter E.; and Fitzsimmons, George W., to Boeing Company, The. Low cost microwave receiver for ILS. 3,967,278, Cl. 343-108.00R.
Buelow, William H.: *See*—
Haker, Edwin J.; Buelow, William H.; and Riddle, Charles F., 3,966,344.
Bugaut, Andree: *See*—
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,966,722.
Buike, Melvin L.: *See*—
Grazen, Frank S.; Buike, Melvin L.; and Bryzinsky, Frank M., 3,966,670.
Buker, Donald O., to Amax Inc. Process for thermal dissociation of molybdenum disulfide. 3,966,459, Cl. 75-84.000.
Bullen, Leslie G.: *See*—
Bennett, Derek J.; and Bullen, Leslie G., 3,965,512.
Bunce, Roger Abraham: *See*—
Greaves, Geoffrey Stuart; Deverill, Ian; and Bunce, Roger Abraham, 3,966,322.
Bunda, Tsuchio: *See*—
Okano, Ryoichi; Bunda, Tsuchio; Mizusawa, Shinichiro; and Morita, Akiyoshi, 3,966,443.
Bunel, Jacques Charles Louis: *See*—
Tranchart, Jean-Claude; and Bunel, Jacques Charles Louis, 3,966,416.
Bunker Ramo Corporation: *See*—
Bennett, Derek J.; and Bullen, Leslie G., 3,965,512.
Mathe, Istvan; and Maros, Ronald Richard, 3,966,293.
Bunnell, Edward Denman: *See*—
Averitt, Marnie Carlton; and Bunnell, Edward Denman, 3,967,195.

Burdin, Jacques Antoine, to Societe Anonyme dite ATO CHIMIE. Apparatus for applying plastic coatings to small bodies. 3,965,858, Cl. 118-417.000.

Bureau de Recherches Geologiques et Minieres: *See—*
Jacob, Claude J., 3,966,884.

Burger, Charles Frederic, to Du Pont de Nemours, E. I., and Company. Process and apparatus for reclaiming and regenerating spent solvent. 3,966,602, Cl. 210-83.000.

Burgess, John; and Byrd, Don. Safety matchbook. 3,966,041, Cl. 206-108.000.

Burgsmuller, Karl. Device for tapping bores. 3,966,348, Cl. 408-180.000.

Burkhead, Carl E., to Ecodyne Corporation. Method and apparatus. 3,966,599, Cl. 210-14.000.

Burlakova, Lidia Ivanovna: *See—*
Kalach, Vladimir Sergeevich; and Burlakova, Lidia Ivanovna, 3,966,877.

Burroughs Corporation: *See—*
Saxon, Richard A., 3,967,158.

Burton, Frederick J., Jr.: *See—*
Katz, Sheldon B.; Burton, Frederick J., Jr.; and Cullo, Leonard A., 3,966,640.

Busdiecker, Wayne S.: *See—*
Washkewicz, Donald E.; and Busdiecker, Wayne S., 3,966,238.

Buseth, Richard A.: *See—*
Easton, Richard L.; and Buseth, Richard A., 3,965,947.

Bush, David Anthony: *See—*
Arnaud, Nichole; and Bush, David Anthony, 3,966,555.

Bussey, Francis H., Jr.; and Rutherfoord, James K., to Ethyl Corporation. Apparatus for embossing film. 3,966,383, Cl. 425-388.000.

Buus, Jorn Lasse Martin; and Lassen, Niels, to Kefalas A/S. Phenothiazine derivatives, compositions thereof and methods of preparation thereof. 3,966,930, Cl. 424-247.000.

Buus, Jorn Lasse Martin, to Kefalas A/S. Alpha-isomer of the palmitic acid ester of 10-[3-(4-hydroxy-ethyl-1-piperazinyl)propylidene]-2-trifluoromethyl thiaxanthene, compositions thereof and a method of preparaton thereof and use thereof. 3,966,952, Cl. 424-250.000.

Byars, Gordon F.; and Fairbanks, Arthur L., to Security Storage Rentals, Inc. Locking structure. 3,965,707, Cl. 70-120.000.

Bychinsky, Wilfred A., to General Motors Corporation. Silencer element. 3,966,015, Cl. 181-56.000.

Byrd, Don: *See—*
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C.A.V. Limited: *See—*
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C. G. Doris: *See—*
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C. M. Systems, Incorporated: *See—*
Heffron, Allan J.; Estry, Arthur L.; and Chalmers, William F., 3,966,058.

Cabot Corporation: *See—*
Kelley, Eugene W., 3,966,422.

Cachuela, Lawrence P.; and Sanford, George G., Jr., to McDonnell Douglas Corporation. Decoder/analyzer test unit. 3,967,103, Cl. 235-153.0AC.

Caesar, Wilfred George: *See—*
Noakes, Michael Lesney; Caesar, Wilfred George; Holland, William Henry; and Hancock, Norman Herbert, 3,966,646.

Cahen, Raymond Marc: *See—*
Andre, Jacques Maurice Jules; van Thillo, Hugo Johannes; Lammers, Rene Odon; Debus, Henri Robert; and Cahen, Raymond Marc, 3,966,996.

Cailloux, Jean Guy, to Etat Francais. Gripping device for a suspended load. 3,965,842, Cl. 114-235.00R.

Cain, Alfred R., to Firestone Tire & Rubber Company, The. Carbon black dispersions and method of making same. 3,966,668, Cl. 260-37.00N.

Cain, Earl S.; Carlson, Jerome A.; and Goodrich, George E., to Tribotech. Bearing mount. 3,966,275, Cl. 308-15.000.

Cairns, James Anthony; and Pugh, Stanley Frederick, to United Kingdom Atomic Energy Authority. Catalyst. 3,966,645, Cl. 252-465.000.

Caldecott, Ross: *See—*
Young, Jonathan D.; and Caldecott, Ross, 3,967,282.

Cale, Albert Duncan, Jr.; and Leonard, Charles Arthur, to A. H. Robins Company, Incorporated. Method for controlling emesis with N-(1-substituted-3-pyrrolidinyl)benzamides and thiobenzamides. 3,966,957, Cl. 424-274.000.

California Institute of Technology: *See—*
Jahnsen, Vilhelm J., 3,966,410.
Yariv, Amnon, 3,967,213.

Callahan, James L.; Miller, Arthur F.; and Shaw, Wilfrid G., to Standard Oil Company. Amphora aggregates. 3,966,639, Cl. 252-439.000.

Calva-Pellicer, Cesar. Device for collection of samples for microbiological studies. 3,966,558, Cl. 195-139.000.

Calvin, Chester W.: *See—*
Kellogg, Walter J.; and Calvin, Chester W., 3,967,192.

Cameron, Donald K., to General Motors Corporation. Cover assembly for an occupant restraint system. 3,966,227, Cl. 280-752.000.

Campbell, David D.; and Klove, Edwin H., Jr., to General Motors Corporation. Multiple inflation rate occupant restraint system. 3,966,224, Cl. 280-735.000.

Campbell, Robert W., to Phillips Petroleum Company. Arylene sulfide copolymer production. 3,966,688, Cl. 260-79.000.

Campbell Soup Company: *See—*
Wachtell, George Peter; and Jones, Edward Wilred, 3,965,741.

Campbell, Sterrett Paxton: *See—*
Reubens, Clarence Edmond; Campbell, Sterrett Paxton; and Marston, Lloyd Everett, 3,965,654.

Campbell, Willis R.; Waldrop, Thomas W.; and Seymour, Shaun A., to Sperry Rand Corporation. Large round bale handling apparatus. 3,966,063, Cl. 214-83.360.

Camras, Marvin, to IIT Research Institute. Video magnetic transducer system with phase correcting network. 3,967,318, Cl. 360-65.000.

Canada Packers Limited: *See—*
Bharucha, Kekhusroo R.; Cross, Charles K.; and Rubin, Leon J., 3,966,974.

Canadian Patents and Development Limited: *See—*
Meadus, Frederick Weldon; Sparks, Bryan David; and Puddington, Ira Edwin, 3,967,034.

Candor, James T. Liquid removing method and apparatus. 3,965,581, Cl. 34-1.000.

Candor, James T. Frame construction for a plural page document. 3,965,594, Cl. 40-104.020.

Candor, James T. Method for removing liquid from bearing material. 3,966,575, Cl. 204-180.00R.

Canron, Inc.: *See—*
Stewart, John Kenneth, 3,965,822.

Cappel, Marie-Luise: *See—*
Frohlich, Alfons; and Cappel, Marie-Luise, 3,965,833.

Caprino, Luciano, to Istituto Farmacologico Serono S.p.A. Treatment of heart diseases. 3,966,915, Cl. 424-177.000.

Carder, Charles H., to Union Carbide Corporation. Photocurable low gloss coatings containing silica and acrylic acid. 3,966,572, Cl. 204-159.160.

Carey, Paul L., to Ralston Purina Company. Process for the production of oilseed isolates. 3,966,702, Cl. 260-123.500.

Carey, Thomas H., to Columbia Research Laboratories, Inc. Externally mounted transducer for detecting changes of fluid pressure in a pipe. 3,965,745, Cl. 73-398.0AR.

Carl Zeiss-Stiftung: *See—*
Grosskopf, Rudolf, 3,967,053.
Korn, Siegfried; Kratzer, Bernd; and Muckenhaupt, Otto, 3,966,311.

Carlin, William W., to PPG Industries, Inc. Electrophoretic deposition of asbestos diaphragms. 3,966,576, Cl. 204-181.000.

Carlson, Jerome A.: *See—*
Cain, Earl S.; Carlson, Jerome A.; and Goodrich, George E., 3,966,275.

Carpenter Chemical Company: *See—*
Albright, Jack W., 3,966,483.

Carpenter, Robert E., to Ashland Oil, Inc. Fire-retardant panel construction. 3,967,033, Cl. 428-307.000.

Carr, James P. Vehicle suspension. 3,966,223, Cl. 280-712.000.

Carroll, Frank E., to Decks, Incorporated. Insulated roofing structure and method. 3,965,633, Cl. 52-309.000.

Carroll, Frank E., to Decks, Incorporated. Sheet metal structural shape and use in insulated decking structure and method. 3,965,641, Cl. 52-738.000.

Carter, George W., to Abbott Laboratories. 10 (N-methyl-4-piperidylidene)-10H[1]-benzopyrano[3,2-b]-pyridine as an analgesic, anti-inflammatory and agent against type III hypersensitivity disease. 3,966,944, Cl. 424-263.000.

Cary Metal Products, Inc.: *See—*
Curran, Thomas F., 3,966,105.

Casebier, Ronald Leroy; and Sears, Karl David, to International Telephone and Telegraph Corporation. Aminated sulfite derivatives of coniferous barks. 3,966,708, Cl. 260-236.500.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
Piesch, Steffen; and Engelhardt, Friedrich, 3,966,769.
Ribka, Joachim; Engelhardt, Friedrich; and Piesch, Steffen, 3,966,689.

Cassidy, John Edward; and Millar, Philip Glenn, to Imperial Chemical Industries Limited. Refractory binder. 3,966,482, Cl. 106-64.000.

Cassou, Maurice Jean-Pierre. Apparatus for grouping artificial insemination straws. 3,965,649, Cl. 53-127.000.

Catalyst Research Corporation: *See—*
Roberts, Charles Clifton, 3,966,440.

Caterpillar Tractor Co.: *See—*
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Goloff, Alexander, 3,966,368.
Guhl, Richard E.; and Renfro, Kenneth W., 3,966,254.
Schexnayder, Lawrence F., 3,966,066.

Cattaneo, Mario. Method for enveloping pellets of foamed polystyrene suitable for producing lightened manufactured articles of cement. 3,967,005, Cl. 427-202.000.

Cavalier Packaging Company, Inc.: *See—*
Tipton, William G., 3,966,113.

Caveney, Jack E.; and Moody, Roy A., to Panduit Corporation. Integral cable tie. 3,965,538, Cl. 24-16.0PB.

Cayle, Theodore; and Moskowitz, Gerard J., to Baxter Laboratories, Inc. Enzyme-treated paper. 3,966,543, Cl. 162-158.000.

CBS Inc.: *See—*
Bauer, Benjamin B., 3,967,063.

CCL Systems Limited: *See—*
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Ceder, James H.: *See—*
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Celanese Coatings & Specialties Company: *See—*
Wolfe, Norman Gilbert, 3,966,669.

Centro-Maskin i Goteborg AB: *See—*
Sipek, Ladislav; and Smars, Erik, 3,966,504.
Ceramic Magnetics, Inc.: *See—*
Sommer, Alfred, 3,966,578.
Ceres Ecology Corporation: *See—*
Gaynor, William Wayne; and Voigt, Gene Ray, 3,966,607.
Ceresa, Myron; and Zimmerman, Richard Henry, to AMP Incorporated. Interconnection of oppositely disposed circuit devices. 3,967,162, Cl. 317-101.0CM.
Cesca, Sebastiano: *See—*
Arrighetti, Sergio; Brancaccio, Aldo; Cesca, Sebastiano; and Giuliani, Gianpaolo, 3,966,844.
Ceskoslovenska akademie ved: *See—*
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Chain, Ernst Boris; Buck, Kenneth William; Darbyshire, Joan Elizabeth; Banks, Geoffrey Talbot; Himmelweit, Fred; and Ratti, Giulio, to Beecham Group Limited. Process for preparing double stranded RNA. 3,966,707, Cl. 260-211.5OR.
Challenge-Cook Bros., Incorporated: *See—*
Freze, Benjamin H., 3,966,441.
Chalmers, Brian John; and Gibson, John Philip, to C.A.V. Limited. Electrical inverter circuit. 3,967,184, Cl. 321-45.00C.
Chalmers, William F.: *See—*
Heffron, Allan J.; Estry, Arthur L.; and Chalmers, William F., 3,966,058.
Chambers Corporation: *See—*
Valle, Michael A., 3,967,164.
Chambers, Derek; and Harley, A. Leonard, to Raytheon Company. Converter wherein switching frequency is independent of output voltage and is synchronized to an external system. 3,967,181, Cl. 321-2.000.
Chambers, James Q.: *See—*
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Champion International Corporation: *See—*
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Champion Spark Plug Company: *See—*
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Chang, Hsu; and Lee, Share-Young, to International Business Machines Corporation. Text editing system. 3,967,263, Cl. 340-172.500.
Chang, Kuo Wei; and Aisenberg, Sol. Apparatus for measuring alcohol concentrations. 3,966,579, Cl. 204-195.00R.
Chapman, Arthur S., to Hughes Aircraft Company. Image derotation device for relaying optical paths off or across gimbals. 3,966,298, Cl. 350-23.000.
Chapman, Charles C., to Phillips Petroleum Company. Apparatus for contacting alkylate containing alkyl fluoride with hydrogen fluoride. 3,966,417, Cl. 23-283.000.
Chappelie, Norman Andrew: *See—*
Robitschek, Paul; Chappelie, Norman Andrew; and Lorimer, John Wallace, 3,966,658.
Chappell, Albert R., to Metalife Company, The. Horizontally-operated pump-type dispenser. 3,966,095, Cl. 222-384.000.
Chapuis, Henri: *See—*
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Charbonnages de France: *See—*
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Charles O. Larson Co.: *See—*
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Charlton, Ralph W.; and Varadhachary, Seevaram N., to Congoleum Industries, Inc. Lubrication of extruded materials. 3,966,857, Cl. 264-75.000.
Charpentier, Jean-Max; Glikmans, Georges; and Maldonado, Paul, to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf. Process for producing citric acid by fermentation. 3,966,553, Cl. 195-28.00R.
Chavanat, Paul; Epsztein, Bernard; and Mourier, Georges, to Thomson-CSF. Electronic frequency tuning magnetron. 3,967,155, Cl. 315-39.550.
Chembond Corporation: *See—*
Robitschek, Paul; Chappelie, Norman Andrew; and Lorimer, John Wallace, 3,966,658.
Chemetron Corporation: *See—*
Cranage, Bidwell Chapman, 3,965,903.
Chemische Werke Huls Aktiengesellschaft: *See—*
Feldmann, Rainer; Kriesten, Wolfgang; Muller, Karl Adolf; Panoch, Hans Joachim; and Scholten, Heinz, 3,966,838.
Flatau, Karsten; and Terwiesch, Bernd, 3,966,695.
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Chen, Tung Chang. Device for enabling a fixed sensor of an automatic electronic flash unit to respond to bounced light. 3,967,106, Cl. 240-1.300.
Cheney, Robert W. Wheelchair lift assembly. 3,966,022, Cl. 187-12.000.
Cheng, Bao-Ding, to Colgate-Palmolive Company. Liquid detergents containing chelidamic acids and salts thereof. 3,966,649, Cl. 252-542.000.
Cheng, Roberta C.: *See—*
Dorman, Linneaus C.; and Cheng, Roberta C., 3,966,701.
Cherne Industrial, Inc.: *See—*
Boler, Leonard J., 3,966,859.
Chesnel, Pierre: *See—*
Lavigne, Jean; Chesnel, Pierre; and Bouguyon, Gerard, 3,965,993.
Chester, Francis B. Aerobic/anaerobic composting device. 3,966,415, Cl. 23-259.100.
Chevron Research Company: *See—*
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Chiba, Kiyoshi: *See—*
Sobajima, Shigenobu; Okaniwa, Hiroshi; Chiba, Kiyoshi; and Takagi, Norio, 3,967,285.
Chiche, Pierre, to Charbonnages de France. Process for production of carbon fibers and the resultant fibers. 3,966,887, Cl. 423-447.000.
Chihara, Shiro: *See—*
Ito, Akiro; Ichikawa, Yasushi; Horiguchi, Sadayuki; Shirota, Shyoji; Kayama, Yasuo; Chihara, Shiro; Haneda, Isoko; Hasuda, Katsumi; and Takano, Shyoichi, 3,966,913.
Chisholm, Duncan, to Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Nothern Ireland, The. Control of two-phase thermosyphons. 3,965,970, Cl. 165-32.000.
Chisso Corporation: *See—*
Fukui, Masahiro; Hayashi, Shigeru; Okamoto, Takehiko; Koga, Isao; and Inoi, Takeshi, 3,966,822.
Chodnekar, Madhukar Subraya; Loeliger, Peter; Pfiffner, Albert; Schwieter, Ulrich; Suchy, Milos; and Zurfluh, Rene, to Hoffmann-La Roche Inc. Propargyl esters of 7,11-substituted dodecadienoic acids. 3,966,780, Cl. 260-410.90N.
Chomette, Albert Etienne, to Fajella, Francis J., a part interest. Internal bun toaster. 3,965,808, Cl. 99-419.000.
Christensen, Kenneth, to Illinois Tool Works Inc. Electrical capacitor having alternating metallized nonheat-shrinkable dielectric layers and heat-shrinkable dielectric layers. 3,967,168, Cl. 317-258.000.
Christie, Joe William. Apparatus and method for joining a branching fitting to a pipe. 3,966,528, Cl. 156-293.000.
Christofer, Donald E.: *See—*
Stock, Arthur J.; Christofer, Donald E.; and Brinza, Joseph E., 3,966,175.
Christoph, Geert; Radlmann, Eduard; Nischk, Gunther; Bruns, Ludwig; and Schnuchel, Gunther, to Bayer Aktiengesellschaft. Permanently antistatic polyamide compositions. 3,966,835, Cl. 260-830.00P.
Christopher, Charles A., to Texaco Inc. Method for oil recovery improvement. 3,965,986, Cl. 166-292.000.
Chromalloy-Alcon Inc.: *See—*
Schultz, Ronald L., 3,966,292.
Chromatix, Inc.: *See—*
Dere, Daniel J.; and Wallace, Richard W., 3,967,212.
Chromecek, Richard C., to Airwick Industries, Inc. Polymer complex carriers for an active ingredient. 3,966,902, Cl. 424-59.000.
Chudnovsky, Vladimir Sergeevich: *See—*
Novikov, Sergei Sergeevich; Khmelnitsky, Lenor Ivanovich; Lebedev, Oleg Vasilievich; Epishina, Lia Vladimirovna; Suvorova, Ljudmila Ivanovna; Lapshina, Lidia Vasilievna; Krylov, Valery Dmitrievich; Zaikonnikova, Irina Vitalievna; Zimakova, Irina Evgenievna; Chudnovsky, Vladimir Sergeevich; Babichev, Viktor Andreevich; and Avdonina, Nina Alexandrovna, 3,966,742.
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Ciba-Geigy Corporation: *See—*
Abel, Heinz; Dobinson, Bryan; Green, George Edward; Harris, Melvin; Stark, Bernard Peter; and Winterbottom, Kenneth, 3,967,041.
Beriger, Ernst; Kristiansen, Odd; Rufenacht, Kurt; and Bader, Jorg, deceased, 3,966,921.
Bohner, Beat; Dawes, Dag; Meyer, Willy; Kristinsson, Haukur; and Rufenacht, Kurt, 3,966,754.
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Oesterlein, Fritz; and Riat, Henri, 3,966,705.
Oxe, Josef; and Keller, Rudolf, 3,966,659.
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Cima Kogaku Company Limited: *See—*
Nagashima, Motoi, 3,967,291.
Cimins, John B., to J & H Co. Machine for covering a pallet load with shrinkable plastic film. 3,965,652, Cl. 53-183.000.
Cincinnati Butchers' Supply Co., The: *See—*
Zaenkert, Fred A., 3,966,617.
Cincinnati Milacron-Heald Corporation: *See—*
Vaillette, Bernard D.; and Zastawny, William E., 3,965,765.
Cipriani, Gioacchino; and Perrotti, Emilio, to Snam Progetti S.p.A. Copper base metalorganic compounds and process for the preparation thereof. 3,966,782, Cl. 260-438.100.
Circon Corporation: *See—*
Walton, Joe W., 3,967,054.
Cities Service Company: *See—*
Driscoll, Richard E.; and Milligan, Hugh E., 3,966,692.
Claes, Hendrik Armand Denis; and Gelling, Wolter Geppienus, to U.S. Philips Corporation. Manufacturing semiconductor devices in which silicon slices or germanium slices are etched and semiconductor devices thus manufactured. 3,966,517, Cl. 156-7.000.
Clark, Charles R.; Gregory, M. Duane; Kerfoot, Oliver C.; Krehbiel, Delmar D.; and Kennedy, Carl D., to Continental Oil Company. Waterflood method using overbased normal alkylaromatic sulfonates. 3,965,984, Cl. 166-270.000.

Clark Equipment Company: *See—*
Johns, Robert C., Jr., 3,965,587.
Clark, Joel P.: *See—*
Clarke, David E.; Lackey, Robert P.; and Clark, Joel P., 3,967,227.
Clark, Robert T., to Standard Oil Company. Single unit carrier for drinkware. 3,966,102, Cl. 224-45.00A.
Clark, Robert V.; Linder, Francis X.; McCreary, Terrance J.; and Taylor, William R., to Automation Industries, Inc. Large area motion sensor. 3,967,283, Cl. 343-7.700.
Clark, Wallace. Method of operating an internal combustion engine with solvent refined coal as a fuel. 3,965,870, Cl. 123-23.000.
Clarke, David E.; Lackey, Robert P.; and Clark, Joel P., to Texas Instruments Incorporated. Actuator system with ambient temperature compensation. 3,967,227, Cl. 337-124.000.
Clasen, Theodor: *See—*
Beaver, Ruby C.; Clasen, Theodor; Henning, Wolfgang; and Johnson, Emil S., 3,967,194.
Clayton Manufacturing Company: *See—*
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Cline, Edwin Lee, 3,965,732.
Clean Energy Corporation: *See—*
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Cramer, Frank B., 3,966,583.
Cleaveland, Charles M., to Westinghouse Electric Corporation. Supporting means for the power conductors in circuit breakers. 3,967,163, Cl. 317-112.000.
Clemence, Francois: *See—*
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Clemens, David Henry: *See—*
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Cleveland Hardware & Forging Co.: *See—*
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Clifford, Louis R.: *See—*
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Schmitt, Josef, deceased, 3,966,793.
Cline, Edwin Lee, to Clayton Manufacturing Company. Computer type brake analyzer. 3,965,732, Cl. 73-126.000.
Clowers, Earl R.; and Azelkas, Walter G., to Singer Company, The. Vacuum cleaner filter assembly. 3,966,444, Cl. 55-356.000.
Cloyd, Harold S., to Nosco Plastics, Inc. Syringe. 3,965,898, Cl. 128-220.000.
Coal Industry (Patents) Limited: *See—*
Andrews, John Frederick Collett; Beton, Roy Victor; Leavens, Kenneth David; and Scott, Gordon John, 3,966,060.
Blunt, Geoffrey Vincent Dallow; and Hodges, Newton John, 3,966,653.
Gray, Michael David; and Kimber, Geoffrey Michael, 3,966,584.
Gray, Michael David; Kimber, Geoffrey Michael; and Shipley, David Ernest, 3,966,585.
Coats & Clark, Inc.: *See—*
Hannes, Karl; and Rossi, Paul C., 3,965,779.
Cocke, Emory L.; Muncie, Fred W., deceased; and by Muncie, John W., executor, to Cocke, Emory L. Method of reducing air pollution by recovering d-limonene from citrus pulp processing operation. 3,966,984, Cl. 426-472.000.
Cogas Development Company: *See—*
Friedman, Louis D., 3,966,633.
Sacks, Martin E., 3,966,634.
Cohen, Bernard: *See—*
Rivman, Samuel J.; Cohen, Bernard; and Da Costa, Alvaro, 3,965,952.
Cohen, Camel: *See—*
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Cohen, Ella: *See—*
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Cohen, Robert: *See—*
Mayer, Salvador Escobar, Sr., 3,966,183.
Cohn, Robert, to Champion International Corporation. Apparatus for applying sealing material to envelopes. 3,965,851, Cl. 118-1.000.
Colegrove, George T., to Merck & Co., Inc. Clarification of xanthan gum. 3,966,618, Cl. 252-8.55D.
Colgate-Palmolive Company: *See—*
Cheng, Bao-Ding, 3,966,649.
Cullum, Douglas Charles; and Collinge, Joan, 3,966,901.
Douglass, Miriam L., 3,966,928.
Gray, Frederick W., 3,966,627.
Karami, Hamzeh, 3,965,906.
Klingaman, Richard James, 3,966,089.
Price, Edward John, 3,965,955.
Rayner, George Geoffrey, 3,966,432.
Collinge, Joan: *See—*
Cullum, Douglas Charles; and Collinge, Joan, 3,966,901.
Collins, Arthur. Breech cartridge remover. 3,965,795, Cl. 89-1.50F.
Collins, Dalford D. Tilt top golf tee. 3,966,214, Cl. 273-207.000.
Collins, Daniel E.: *See—*
Jackson, Larry L.; Seifert, Walter F.; and Collins, Daniel E., 3,966,626.
Colliopoulos, John A.; and Yanick, Nicholas S., to G. D. Searle & Co. Vegetable oil emulsion. 3,966,632, Cl. 252-309.000.
Colomb, Henry Octave, Jr.; Trecker, David John; and Brotherton, Thomas Kemper, to Union Carbide Corporation. Dinorbornenes. 3,966,797, Cl. 260-484.00A.
Colston, John R.; and O'Neill, Wilbur J., to Westinghouse Electric Corporation. Underwater breathing apparatus. 3,965,892, Cl. 128-142.300.
Columbia Research Laboratories, Inc.: *See—*
Carey, Thomas H., 3,965,745.
Columbus Auto Parts Company, The: *See—*
Amos, James J., 3,965,554.
Combs, Robert L., to Eastman Kodak Company. Mixtures of polyesters and DAC-B resin. 3,966,841, Cl. 260-873.000.
Combustion Engineering, Inc.: *See—*
Barrus, Donald Martin, 3,965,757.
Deve, Vagn, 3,966,174.
Cominco Ltd.: *See—*
Crossley, Cecil L.; Hirsch, Horst E.; and Liang, Shou C., 3,966,568.
Commercial Solvents Corporation: *See—*
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Shipchandler, Mohammed T., 3,966,699.
Commissariat a l'Energie Atomique: *See—*
Bathellier, Andre; and Germain, Michel, 3,966,804.
Baylac, Bernard; Merckel, Gerard; and Meunier, Pierre, 3,967,208.
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Compagnie Industrielle des Lasers: *See—*
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Beduchaud, Michel; and Ramadier, Andre, 3,966,187.
Compoflex Company Limited: *See—*
O'Brien, Patrick William, 3,966,379.
Compton, Ralph M.; and Jenkins, Johnny W., Jr. Shuttle spring. 3,965,941, Cl. 139-207.000.
Cone, Charles N.; and Steinberg, Julius M., to Pacific Adhesives, Inc. Plywood manufacture using foamed glues. 3,965,860, Cl. 118-612.000.
Congoleum Industries, Inc.: *See—*
Charlton, Ralph W.; and Varadhachary, Seevaram N., 3,966,857.
Conley, Dell; Ferrell, Howard H.; and Lescarboura, Jaime A., to Continental Oil Company. Subsurface transient pressure testing apparatus and method of use thereof. 3,965,978, Cl. 166-113.000.
Connell, Robert I. Security bar assembly for double doors. 3,966,243, Cl. 292-40.000.
Connors, Frank T., to Symons Corporation. She-bolt type gripper device for concrete wall form tie rods of indeterminate length. 3,965,543, Cl. 24-136.00R.
Consolcase, Inc.: *See—*
Kroger, Douglas J.; Kroger, Donald J.; Jensen, Winton D.; and Rohrs, Donald L., 3,966,076.
Conta, Renato; Montanari, Lucio; and Brescia, Riccardo, to Ing. C. Olivetti & C., S.p.A. Electrothermal print head. 3,967,092, Cl. 219-216.000.
Continental Oil Company: *See—*
Beaty, William Ralph, Jr., 3,966,588.
Clark, Charles R.; Gregory, M. Duane; Kerfoot, Oliver C.; Krehbiel, Delmar D.; and Kennedy, Carl D., 3,965,984.
Conley, Dell; Ferrell, Howard H.; and Lescarboura, Jaime A., 3,965,978.
Doerr, Richard E.; McCain, David L.; and Davis, David H., 3,966,261.
Pace, Gerald F.; Stauter, John C.; Armstrong, Calvin N.; and Harris, Gary R., 3,966,567.
Reynolds, David E., 3,966,088.
Contois, Lawrence E.; and Rule, Norman G., to Eastman Kodak Company. Organic photoconductors with triamino benzene additives. 3,966,468, Cl. 96-1.500.
Control Data Corporation: *See—*
Harrington, Daniel Clayton, 3,967,105.
Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, to Glaxo Laboratories Limited. 7-β-Acylamido-3-carbamoyloxymethylceph-3-em-4-carboxylic acids and salts thereof. 3,966,717, Cl. 260-243.00C.
Cooper, Herbert Warren; Acevedo, John; and deKlerk, John, to Westinghouse Electric Corporation. Surface acoustic wave delay line with bulk wave discrimination. 3,967,221, Cl. 333-30.00R.
Copal Company Limited: *See—*
Matsuda, Yasuhisa, 3,966,134.
Yaguinuma, Jyusuke, 3,967,078.
Coquelet, Andre; and Nepote, Alain, to Mitchell S.A. Fishing reel. 3,966,140, Cl. 242-217.000.
Corbett, Marshall J.; and Kress, Robert W., to Grumman Aerospace Corporation. Vertical takeoff and landing aircraft. 3,966,142, Cl. 244-12.00A.
Cornett, Walter Goza, III: *See—*
Reilly, Richard J.; Cornett, Walter Goza, III; Riddle, James H.; and Wharmby, David, 3,965,902.
Cornillault, Jean, to Compagnie Industrielle des Lasers. Device for determining the profile of a surface. 3,967,114, Cl. 250-236.000.
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Amos, Lynn G.; and Boone, Jerry S., 3,967,109.
Hollis, David L., 3,967,108.
Rogers, Charles H.; and Sage, Burton H., Jr., 3,967,110.
Corning, Lee M. Photographer's copy stand. 3,967,301, Cl. 354-292.000.
Corral, Jose; and Spector, George. Heavy weight hanger. 3,966,157, Cl. 248-217.000.
Corsette, Douglas F. Toilet chemical dispenser. 3,965,497, Cl. 4-227.000.

Corsmeier, Robert J., to General Electric Company. Blade baffle damper. 3,966,357, Cl. 416-97.00R.

Cosgrove, James F.: *See—*
McCain, William B.; Cosgrove, James F.; and Zagorski, Edward J., 3,966,185.

Costantini, Joseph A.; Flint, Glen E.; and Lanier, Richard J., to Standard Electric Time Corporation. Tape cassette. 3,966,107, Cl. 226-59.000.

Cosyns, Jean; Juguin, Bernard; Le Page, Jean-Francois; and Miquel, Jean, to Institut Francaise du Petrole, de Carburants et Lubrifiants. Process for hydrodealkylating alkylaromatic hydrocarbons. 3,966,833, Cl. 260-672.00R.

Cote, Gerald J.; Lewis, John A., Jr.; and Skurski, James K., to Polaroid Corporation. Accessory attachment for photographic apparatus. 3,967,302, Cl. 354-295.000.

Cottrell, Harold L.; and Mamo, Anthony C., to Power Control, Inc. Hydrokinetic device. 3,965,680, Cl. 60-357.000.

Cowie, Charles J.: *See—*
MacDonald, Ian M.; and Cowie, Charles J., 3,967,170.

Cracknell, Robert Ian: *See—*
Bagg, Greville Euan Gordon; and Cracknell, Robert Ian, 3,965,722.

Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. Pharmaceutical compositions and method of treatment employing 1,3-dioxo-2,2-disubstituted indanyloxy alkanoic acids. 3,966,966, Cl. 424-317.000.

Craig, John W. T.; O'Neill, Eoin P.; and Keairns, Dale L., to United States of America, Environmental Protection Agency. Waste stone oxidation and recarbonization. 3,966,431, Cl. 48-197.00R.

Cramer, Frank B., to Clean Energy Corporation. Solubilization and reaction of coal and like carbonaceous feedstocks to hydrocarbons and apparatus therefor. 3,966,582, Cl. 208-8.000.

Cramer, Frank B., to Clean Energy Corporation. Coal treatment process and apparatus. 3,966,583, Cl. 208-8.000.

Cranage, Bidwell Chapman, to Chemetron Corporation. Suction bottle assembly. 3,965,903, Cl. 128-276.000.

Crane, Grant; and Kay, Edward Leo, to Firestone Tire & Rubber Company, The. Pyrolization. 3,966,487, Cl. 106-307.000.

Crane, Robert L.: *See—*
Hollenberg, Glenn W.; and Crane, Robert L., 3,966,855.

Crankshaft Machine: *See—*
Heffron, Allan J.; Estry, Arthur L.; and Chalmers, William F., 3,966,058.

Crawford, Elsie. Modular post and beam joint. 3,966,337, Cl. 403-170.000.

Crawley, Lantz Stephen; and Safir, Sidney Robert, to American Cyanamid Company. Substituted dibenzo[b,f]tetrazolo[1,5-d][1,4]-oxazepines. 3,966,756, Cl. 260-308.00D.

Cremer, Charles W.; Eastman, James E.; and Schanefelt, Robert V., to A. E. Staley Manufacturing Company. Granular modified starch binder for dough forming of puffable food products. 3,966,990, Cl. 426-550.000.

Creusot-Loire: *See—*
Honnorat, Yves C.; Raisson, Gerard D.; and Morlet, Jean G., 3,966,374.

Crewe, Peter Rowland, to British Hovercraft Corporation Limited. Air cushion vehicles. 3,966,012, Cl. 180-127.000.

Croese, Hendrik Magchiel Willem. Method for hauling a vessel alongside a mooring platform. 3,965,841, Cl. 114-230.000.

Crompton, Nettlefold Stenman Limited: *See—*
Wigfall, Douglas Mervyn, 3,965,532.

Cronin, Timothy H.; and Hess, Hans-Jurgen E., to Pfizer Inc. Piperazino quinazoline bronchodilators. 3,966,936, Cl. 424-251.000.

Cross, Charles K.: *See—*
Bharucha, Kekhusroo R.; Cross, Charles K.; and Rubin, Leon J., 3,966,974.

Crossley, Cecil L.; Hirsch, Horst E.; and Liang, Shou C., to Cominco Ltd. Electrowinning of gallium. 3,966,568, Cl. 204-105.00R.

Crossley, Wade William: *See—*
Hyland, Anthony Joseph; and Crossley, Wade William, 3,966,295.

Crounse, Nathan N.; and Ambrosiano, Nicholas A., to Sterling Drug Inc. Thiazolidinylidene isoindoline pigments. 3,966,753, Cl. 260-306.70R.

Crowley, Thomas N.; and Urbanski, David M., to Amchem Products, Inc. Process for the treatment of waste water from a fiberglass manufacturing process. 3,966,600, Cl. 210-46.000.

Crown, Marlyn Dale; and Finley, Carl Eugene, to Olin Corporation. Fluid metering valve. 3,966,097, Cl. 222-402.200.

Csatar, Kalman; and Soha, Istvan, to Orszagos Erc- es Asvanybanyak. Sorpitional carrier materials and a process for the preparation thereof. 3,966,641, Cl. 252-449.000.

Cuer, Jean-Pierre; and Texier, Nicole, to Produits Chimiques Ugine Kuhlmann. Method of preparing barium hydroxide. 3,966,894, Cl. 423-638.000.

Cullen, William P.: *See—*
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Cullinan, John R. Dual spring rear suspension for motorcycles. 3,966,006, Cl. 180-32.000.

Cullo, Leonard A.: *See—*
Katz, Sheldon B.; Burton, Frederick J., Jr.; and Cullo, Leonard A., 3,966,640.

Cullum, Douglas Charles; and Collinge, Joan, to Colgate-Palmolive Company. Dentifrice preparation. 3,966,901, Cl. 424-52.000.

Cummins Engine Company, Inc.: *See—*
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Cunningham, Ernest Ray, to Grip-Pak, Inc. Scrapless plastic sheet multi-packaging device. 3,966,044, Cl. 206-427.000.

Cupler, John A., II. Vee bearing having adjustable V journal profile. 3,966,277, Cl. 308-36.000.

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Curran, Thomas F., to Cary Metal Products, Inc. Web aligning apparatus. 3,966,105, Cl. 226-21.000.

Curry, Kenneth Vasey; Gamadia, Rustom Kooverji; and Pike, Barry Graham, to Lever Brothers Company. Aerosol dispensing device containing a hairsetting preparation having a low propellant content. 3,966,087, Cl. 222-192.000.

Cutter Laboratories, Inc.: *See—*
Dabney, William C., 3,965,895.

Cutts, Ernest; and Knight, Geoffrey Thomas, to Malaysian Rubber Producers' Research Association, The. Surface treatment of polymers. 3,966,530, Cl. 156-308.000.

Cynamon, Sam. Swimming apparatus. 3,966,202, Cl. 272-71.000.

Dabney, William C., to Cutter Laboratories, Inc. Apparatus for controlled volume and rate administration of liquids. 3,965,895, Cl. 128-214.00C.

Da Costa, Alvaro: *See—*
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Dageford, Ernest C., to BEC Products, Inc. Diagnostic annuncistor. 3,967,281, Cl. 340-415.000.

Dahl, Robert M. Index file. 3,966,050, Cl. 211-10.000.

Daicel Ltd.: *See—*
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Daimler-Benz Aktiengesellschaft: *See—*
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Dainippon Ink and Chemicals, Incorporated: *See—*
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Daiwa Boseki Kabushiki Kaisha: *See—*
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Dalbiom, Gunnar, to Barracudaverken Aktiebolag. Camouflage sheet and method for manufacturing the same. 3,967,026, Cl. 428-195.000.

D'Alo, Herbert Fred, to Abbott Laboratories. Vacuum device for an expandable container. 3,965,946, Cl. 141-51.000.

Dames & Moore: *See—*
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D'Amiano, Anthony J. Method for lowering ground water. 3,965,685, Cl. 61-11.000.

D'Amiano, Anthony J. Pre-packed well points. 3,965,981, Cl. 166-228.000.

D'Andrea, Corrado: *See—*
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Danfoss A/S: *See—*
Vind, Holger Wilhelm, 3,967,229.

Danis, Louis J., to Eaton Corporation. Method of making a composite article for rapid heating. 3,967,013, Cl. 427-383.000.

Dansk Industri Syndikat A/S: *See—*
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Darbyshire, Joan Elizabeth: *See—*
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Das, Suryya K.: *See—*
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Dashew, Stephen S., to Interform, Inc. Adjustable truss support and form for concrete construction. 3,966,164, Cl. 249-18.000.

Daubach, Ewald: *See—*
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Davies, Norman: *See—*
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Davies, Terrence Ardern, to Square D Company. Electrical contact materials and methods of making the same. 3,966,464, Cl. 75-173.00R.

Davis, Bryan Terence: *See—*
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Davis, Charles S.: *See—*
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Davis, Commodore. Balancing device for vehicle wheels. 3,965,752, Cl. 73-457.000.

Davis, David H.: *See—*
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Davis, Marmion Dean: *See—*
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Davis, Michael, to Airway Industries Inc. Locking device for luggage. 3,965,706, Cl. 70-68.000.

Davison, John, to CCL Systems Limited. Reinforcing strand anchorage assembly. 3,965,541, Cl. 24-122.600.

Dawes, Dag: *See—*
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Decker, Kurt. Film changing equipment for rapidly changing films contained in flexible sheaths in radiological X-ray equipment. 3,967,130, Cl. 250-468.000.

Decks, Incorporated: *See—*
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Carroll, Frank E., 3,965,641.

de Cleur, Eckhard; Dhein, Rolf; Rudolph, Hans; and Kreuder, Hans Joachim, to Bayer Aktiengesellschaft. Pulverulent coating materials. 3,966,836, Cl. 260-835.000.

Deep Oil Technology, Inc.: *See—*
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de Jager, Johannes; and Hansma, Hendrik, to Akzo N.V. Process for the preparation of granular or pulverulent organic peroxides. 3,966,787, Cl. 260-463.000.

deKlerk, John: *See—*
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Delahunt, Robert M., to Polaroid Corporation. Film assembly including a hermetically sealed battery. 3,967,292, Cl. 354-174.000.

Dell, Hans-Dieter: *See—*
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Delmar Chemicals Limited: *See—*
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Delphian Foundation, The: *See—*
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Deming, Kenneth R., to General Motors Corporation. Service minder odometer. 3,965,847, Cl. 116-114.00W.

Demou, John G.: *See—*
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Den Bleyker, John R.: *See—*
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Dendy, King Hubert; and Leskin, Morton B., to Leskin, Morton B. Power supply for a laser or gas discharge lamp. 3,967,159, Cl. 315-247.000.

Dennis, Charles L.; and Zemanek, Joseph, Jr., to Mobil Oil Corporation. Acoustic velocity logging system. 3,967,735, Cl. 340-15.5DS.

Denny, Dann W., to General Electric Company. Control circuit, refrigeration system, and method of controlling speed of an alternating current motor. 3,967,172, Cl. 318-227.000.

Den Ouden, Alfons Adriaan, to Brabo Corporation Naamloze Vennootschap. Construction units, some with corresponding pinion wheels mounted in meshed relation. 3,965,610, Cl. 46-17.000.

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Denzel, Theodor: *See—*
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Derolf, M. Robert; and Hertzenberg, Elliot P., to Philadelphia Quartz Company. Precipitating α alumina monohydrate. 3,966,893, Cl. 423-628.000.

DeRosa, John A.: *See—*
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Desalination Systems, Inc.: *See—*
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Deutschlander, Gert, to SIG Schweizerische Industrie-Gesellschaft. Wrapper assembly including an article carrier element. 3,966,046, Cl. 206-445.000.

Deve, Vagn, to Combustion Engineering, Inc. Premix nozzle for kold box process. 3,966,174, Cl. 259-4.00R.

Develco, Inc.: *See—*
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Deverill, Ian: *See—*
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deVial, Raymond Michael, to Bailey Meters & Controls Ltd. Installations for monitoring oil content. 3,965,920, Cl. 137-115.000.

deVries, Egbert, to Quad Corporation. Refrigerated structure. 3,965,698, Cl. 62-454.000.

Devroe, Leo Guillaume, to Antwerp Plastic Merchandising. Package for floral art pieces. 3,966,043, Cl. 206-423.000.

Deweerdt, Julien C.: *See—*
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DeWolf, Charles F.; and Gault, William S., to Rix Industries. High pressure gas-liquid separator. 3,966,437, Cl. 55-219.000.

Dexter, Edward; and Otley, Stephen Reverdy, to United Biscuits Limited. Method and apparatus for treating food pieces. 3,966,983, Cl. 426-439.000.

Deylius, Hendrik Gerardus; Lammers, Jan Frederik; and Notenboom, Antonius Paulus, to U.S. Philips Corporation. Coupling two optical windows. 3,967,123, Cl. 250-368.000.

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Diamond, Julius, to William H. Rorer, Inc. Phenyl butyric acids and derivatives thereof. 3,966,801, Cl. 260-515.00A.

Dick, Perry J.; and Dick, Perry J., Jr., to Trumbull Corporation. Strip paving machine. 3,966,343, Cl. 404-101.000.

Dick, Perry J., Jr.: *See—*
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Dickey, Baron Christian, to Ampex Corporation. Precision optical beam divider and position detector. 3,966,329, Cl. 356-152.000.

Diem, Hans; Dudeck, Christian; and Lehmenn, Gunter, to BASF Aktiengesellschaft. Manufacture of phthalo-bis-guanamines. 3,966,727, Cl. 260-249.900.

Dietrich, John Peter, to Sperry Rand Corporation. Command cue for a flight director instrument. 3,967,236, Cl. 340-27.0AT.

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Dietz, George, Jr.; Skomoroski, Robert M.; and Zobbi, Robert G., to American Chemical & Refining Company Inc. Method for producing alkali metal gold sulfite. 3,966,880, Cl. 423-265.000.

Diggs, Richard E. Irrigation apparatus. 3,966,233, Cl. 61-13.000.

Diggs, Richard E. Apparatus for aerobic decomposition of sewage. 3,966,604, Cl. 210-104.000.

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Dimmick, James Owen; Lewis, Theras Gordon; O'Neill, John Francis; and Fabiano, Lucian Philip, Jr., to Bell Telephone Laboratories, Incorporated. Time division network connection auditing arrangement. 3,967,072, Cl. 179-18.00J.

Dix, Sydney. Solar electrical generating system. 3,965,683, Cl. 60-641.000.

D'Luhy, Emil, to Moore Business Forms, Inc. Rotary die cutter. 3,965,786, Cl. 83-346.000.

Dobias, Joseph J., to NCR Corporation. Method and apparatus for recovering data and clock information in a self-clocking data stream. 3,967,061, Cl. 178-69.50R.

Dobias, Joseph J., to NCR Corporation. Method and apparatus for encoding data and clock information in a self-clocking data stream. 3,967,062, Cl. 178-69.50R.

Dobinson, Bryan: *See—*
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Dr.-Ing. Manfrid Dreher KG apparatebau und chemisch Verfahrenstechnik fur Oberflachenbehandlung von Metallen: *See—*
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Doerr, Richard E.; McCain, David L.; and Davis, David H., to Continental Oil Company. Coal slurry recovery systems. 3,966,261, Cl. 302-14.000.

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Dollar, David L., to Ball Corporation. High strength wrought zinc alloy. 3,966,505, Cl. 148-11.50R.
Dolveck, Gilbert, to Aluminium Suisse S.A. Process for the production of aerosol dispensing and similar metal cans. 3,965,834, Cl. 113-120.00Y.
Dominick, George G.; Lugowski, Ronald J.; Goodrich, Phillip D.; and Erickson, Kenneth, to Qonaar Corporation. Security box and receptacle housing for valuables. 3,966,116, Cl. 232-7.000.
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Doo, Duncan. Coin-check operated article lock. 3,966,033, Cl. 194-1.00R.
Dorgnon, Roger. Expandable plug. 3,965,794, Cl. 85-77.000.
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Doriel, Joseph, to P.I.D. Patents and Inventions Development Limited. Parking cards. 3,966,232, Cl. 283-23.000.
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Dorosz, Adolph Stephen, to USM Corporation. Assembly for automatic bar tacking. 3,965,830, Cl. 112-121.110.
Dorren, Louis, to Matsushita Electric Corporation of America. Compatible four channel FM system. 3,967,069, Cl. 179-15.0BT.
Doty, Floyd F., to Iowa Manufacturing Company. Frame for cone crusher. 3,966,130, Cl. 241-285.00R.
Doubleday, Eric G. Suction hose with conductor means for electrical current. 3,965,526, Cl. 15-377.000.
Douglass, Miriam L., to Colgate-Palmolive Company. Novel derivatives of pyridazine-2-oxide. 3,966,928, Cl. 424-245.000.
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Drori, Mordeki. Non-side-splash water sprinklers. 3,966,122, Cl. 239-233.000.
D'Silva, Themistocles D. J., to Union Carbide Corporation. 2-(Carbamoyloximino)-4-thiazolidinone compounds as insecticidal, miticidal or nematocidal agents. 3,966,953, Cl. 424-270.000.
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Dumbrell, Richard John, to Procter & Gamble Company, The. Textile softening detergent compositions. 3,966,629, Cl. 252-140.000.
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James, Edward William, II; and Kenney, Warren Eugene, 3,965,548.
Duquette, Francis H.; and Merker, Walter H., Jr., to Miner Enterprises, Inc. Draft gear mechanism and method of assembling same. 3,966,057, Cl. 213-22.000.
Duvia, Orazio. Powered vehicle with controls for loading, unloading and discharge tilting of a separable container. 3,966,068, Cl. 214-317.000.
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Dwyer, Daniel E., Jr.: *See—*
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Ebner, Emanuel C., to Foto-Cube, Inc. Display system for interchangeable presentation and storage of pictures. 3,965,599, Cl. 40-152.000.
Ebner, Jakob, to Gundermann GmbH & Co. KG. Method of making a sealing and insulating coating. 3,967,012, Cl. 427-380.000.
Echida, Nobuhiro: *See—*
Uemura, Masaru; Kuroki, Hitoshi; Echida, Nobuhiro; Kosaka, Yujiro; and Otomo, Kanji, 3,967,020.
Ecodyne Corporation: *See—*
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Economics Laboratory, Inc.: *See—*
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Edamura, Fred Y.; and Sbragia, Ronald J., to Dow Chemical Company, The. Method for protecting plants from soil-borne plant disease organisms using methyl-(4-methylphenyl)-subtituted-tetrazolo (1,5-a)-pyrimidines. 3,966,937, Cl. 424-251.000.
Edl, Wolfgang; Meister, Werner; and Seidl, Hans, to Peroxid-Chemie GmbH. Free radical polymerization of olefinically unsaturated monomers, using pinanyl-peroxyesters. 3,966,840, Cl. 260-860.000.
Edmundson, Charles W., to Stratford Engineering Corporation. Baffling arrangements for contactors. 3,965,975, Cl. 165-108.000.

Eduard Kuesters Maschinenfabrik: *See—*
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Edwards, Bryant, to Illinois Tool Works Inc. Apparatus for forming thin-walled plastic articles. 3,966,382, Cl. 425-387.00B.

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Edwin Cooper & Company Limited: *See—*
Elliott, John Scotchford; Davis, Bryan Terence; and Howlett, Richard Martin, 3,966,807.

Egtvedt, Robert B.; Zwiep, Theodore C.; and Den Bleyker, John R., to Wolverine World Wide, Inc. Method of contour sewing. 3,965,832, Cl. 112-262.000.

Ehrens, Henry; and Nonnenmacher, Frank, to Allenwood Sports, Inc. Self-projecting elastic type projecting device. 3,965,882, Cl. 124-18.000.

Ehret, Gordon F.: *See—*
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Elco Corporation: *See—*
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Elford, Peter Ellice. Container erection apparatus. 3,965,804, Cl. 93-51.0HW.

El-Ghatta, Hussain; and Forrer, Johann Karl, to Inventa AG fur Forschung und Patentverwertung. Process for reactivating platinum catalysts used in production of hydroxylammonium salts. 3,966,635, Cl. 252-413.000.

Elikan, Leonard; Lyon, Ward L.; and Sundar, Parameshwaran S., to Westinghouse Electric Corporation. Uranium complex recycling method of purifying uranium liquors. 3,966,873, Cl. 423-10.000.

Elikan, Leonard: *See—*
Sundar, Parameshwaran; Elikan, Leonard; and Lyon, Ward L., 3,966,872.

Ellenbaum, Frank H.; and Ciesco, Richard, to Molten Metal Engineering Co. Process of using olivine in a blast furnace. 3,966,456, Cl. 75-41.000.

Ellenberger, Jakob, to Ellenberger & Poensgen GmbH. Switching device for the protection of direct current devices. 3,967,169, Cl. 317-33.0SC.

Ellenberger & Poensgen GmbH: *See—*
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Ellenbogen, Leon; and Kohler, Constance Anne, to American Cyanamid Company. 3-(4-Biphenylcarbonyl)propionic acid as an inhibitor of platelet aggregation. 3,966,960, Cl. 424-317.000.

Ellenbogen, Leon; and Kohler, Constance Anne, to American Cyanamid Company. 4-Biphenylacetic acid as an inhibitor of platelet aggregation. 3,966,978, Cl. 424-317.000.

Elliott, Jack P., to J. P. Elliott Associates, Inc. Bearing washer. 3,965,523, Cl. 15-302.000.

Elliott, James B., to Poly-Optics, Inc. Sculpture mold. 3,966,166, Cl. 249-134.000.

Elliott, John Scotchford; Davis, Bryan Terence; and Howlett, Richard Martin, to Edwin Cooper & Company Limited. Lubricant additives, their preparation and compositions containing them. 3,966,807, Cl. 260-559.00D.

Eloranta, Vaito K.; and Ruggles, Benjamin C., to Polaroid Corporation. Interlock mechanism for photographic processng system. 3,967,297, Cl. 354-83.000.

Em. D'Hooge N.V.: *See—*
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Emblem, Harold Garton; and Sargeant, Graham Kenwood, to Zirconal Processes Limited. Hardening of coating containing aluminum hydroxyhalides using a mist of acetate or lactate. 3,967,003, Cl. 427-133.000.

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Engelhardt, Friedrich; Erhard, Karl; and Fuchs, Gundolf, to Deutsche Texaco Aktiengesellschaft. Method of purifying monoalcohols. 3,966,829, Cl. 260-643.00B.

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English Clays Lovering Pochin & Company Limited: *See—*
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Epishina, Lia Vladimirovna: *See—*
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Erickson, Kenneth: *See—*
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Erickson, Lewis C. Hydraulic motor or pump with movable wedge. 3,966,367, Cl. 418-58.000.

Erickson, Robert L. Printer. 3,966,035, Cl. 197-1.00R.

Erickson Tool Company: *See—*
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Ericson, Eric A., to General Electric Company. Anti-turn clip for incorporation in bolted electrical joints. 3,966,296, Cl. 339-263.00R.

Eriksson, Tore, to Aktiebolaget Tudor. Method for the production of lead storage battery electrodes. 3,966,495, Cl. 136-27.000.

Ernst, Richard John, to Illinois Tool Works Inc. Combination drilling and wrenching tool. 3,965,510, Cl. 20-7.000.

Errani, Deo. Switch device for indicating the undue opening of doors and closing-wings. 3,967,080, Cl. 200-61.640.

ESB Incorporated: *See—*
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Esemplare, Pascal E.; and Beeferman, Dennis, to Sutures, Inc. Rubber articles having improved slip coating. 3,967,014, Cl. 427-385.000.

Espy, Herbert H.; and Putnam, Stearns T., to Hercules Incorporated. Cationic water soluble polymeric reaction product of polyaminopolyureylene-epichlorohydrin and nitrogen compound. 3,966,684, Cl. 260-77.50C.

Espy, Herbert H.; and Putnam, Stearns T., to Hercules Incorporated. Cationic water soluble polymeric reaction product of poly(diallylamine)-epihalohydrin and nitrogen compound. 3,966,694, Cl. 526-11.200.

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Ettelt, Gregory A., to Tenco Hydro/Aerosciences, Inc. Circular dissolved gas flotation system. 3,966,598, Cl. 210-44.000.

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Ewing, Joan R.: *See*—
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Faber, Kurt Heinrich Albert Erich, to Sandvik Aktiebolag. Toolholder. 3,965,553, Cl. 29-96.000.
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Farago, Frank John; Sood, Raman Radha; and Stokes, David Michael, to Alcan Research and Development Limited. Method of calcining coke in a rotary kiln. 3,966,560, Cl. 201-32.000.
Farnam, Franklin C. Method of reconstituting mica. 3,966,862, Cl. 264-110.000.
Fastner, Thorwald; and Pammer, Manfred, to Vereingte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Method of continuously casting steel strands, in particular slabs. 3,965,964, Cl. 164-83.000.
Fathauer, Jack E., to RPC Corporation. Spreader for lifting containers. 3,966,069, Cl. 214-620.000.
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Feasey, Ronald George; and Rose, John Brewster, to Imperial Chemical Industries Limited. Phenol precursors. 3,966,851, Cl. 260-949.000.
Feast, Alan Arthur John; and Scott, Charles Mack, to International Synthetic Rubber Company, Limited, The. Preparation of latices. 3,966,661, Cl. 260-29.70H.
Featherston, Richard H.; Fischer, Joseph P.; Garing, Meriwether L.; and Wright, James R., to Reynolds Metals Company. Extraction of alumina from bauxite ores. 3,966,874, Cl. 423-121.000.
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Felburn, J. Phil. Vehicle suspensions. 3,966,222, Cl. 280-685.000.
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Fell, Wolfgang, to Licentia Patent-Verwaltungs-G.m.b.H. Arrangement for guiding a rapidly rotating record carrier foil. 3,967,320, Cl. 360-102.000.
Feltz, Adalbert; Opfermann, Johannes; Voigt, Bernd; and Seliger, Walter, to VEB Pentacon Dresden. Photo-conductive coating containing Ge, S, and Pb or Sn. 3,966,470, Cl. 96-1.500.
Fencl, Miroslav. Interconnection of modular structures. 3,965,627, Cl. 52-79.000.
Feng, Bal-Cwo; and Feng, George Cheng-Cwo, to International Business Machines Corporation. Method for forming dielectric isolation combining dielectric deposition and thermal oxidation. 3,966,514, Cl. 148-187.000.
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Fett, Darrell L., to Honeywell Information Systems, Inc. Data alignment circuit. 3,967,101, Cl. 235-152.000.
Fettweis, Alfred, to Siemens Aktiengesellschaft. Filter having frequency-dependent transmission properties for electric analog signals. 3,967,099, Cl. 235-152.000.
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Fischer, Adolf, deceased (by Fischer, Caecilia Emma, legal representative), to BASF Aktiengesellschaft. Herbicidal mixtures of 3-lower alkyl-2,1-3-benzothiadiazinone-(4)-2,2-dioxides or salts thereof and 1,1'-di-(3,5-dimethylmorpholine-carbonylmethyl)-4,4'-dipyridylium salt. 3,966,451, Cl. 71-91.000.
Fischer, Adolf, deceased (by Fischer, Caecilia Emma, legal representative), to BASF Aktiengesellschaft. Herbicide mixtures of 3-lower alkyl-2,1,3-benzothiadiazinone-(4)-2,2-dioxides or salts thereof and lower alkyl N-(4-aminobenzenesulfonyl)-carbamates. 3,966,452, Cl. 71-91.000.
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Fleck, Jack William. Christmas tree stand. 3,966,153, Cl. 248-512.000.
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Fletcher, Russell Edward, to British Broadcasting Corporation. Analogue to digital converters. 3,967,269, Cl. 340-347.0AD.
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Forward, Geoffrey Charles; Duke, Susan Ann; and Bell, Melissa Anne, to Beecham Group Limited. Oral hygiene compositions. 3,966,863, Cl. 424-52.000.
Foster, Betty Jane; and Tummala, Rao Ramamohana, to International Business Machines Corporation. Sealing glass composition and process. 3,966,449, Cl. 65-43.000.
Foster, Edwin E. Pedal actuated bicycle brake. 3,966,229, Cl. 280-261.000.
Foster Grant Co., Inc.: *See—*
Sims, Willard M., 3,966,839.
Foster, James R., to Franklin Manufacturing Company. Slipping belt clutch. 3,965,768, Cl. 74-242.11R.
Foto-Cube, Inc.: *See—*
Ebner, Emanuel C., 3,965,599.
Foulds, Ronald B.; Kasberg, Alvin H.; Puechl, Karl H.; and Bleiberg, Melvin L., to Atlantic Richfield Company. Reactor fuel assemblies. 3,966,550, Cl. 176-78.000.
Fox, Robert M.; and Wize, Gary A., to General Motors Corporation. Infinite position door hold open. 3,965,531, Cl. 16-140.000.
Frahm, Carl E.; and Frahm, Shirley E. Valved water container with seal. 3,966,093, Cl. 222-185.000.
Frahm, Shirley E.: *See—*
Frahm, Carl E.; and Frahm, Shirley E., 3,966,093.
Fraioli, Anthony V.; and DeRosa, John A., to Plessey Incorporated. Oxidation and sinter-resistant metal powders and pastes. 3,966,463, Cl. 75-108.000.
Francavilla, Vincent J. Display holder for dental materials. 3,966,055, Cl. 211-65.000.
Franklin Manufacturing Company: *See—*
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Frazier, Arthur E., to Phillips Petroleum Company. Method for filtering gas and cleaning of filter bags. 3,966,434, Cl. 55-96.000.
Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees of the Stoneleigh Trust u/d/t Dec. 4, 1973: *See—*
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Fredriksson, Torsten, to Allergan Pharmaceuticals. Composition and method for treating psoriasis. 3,966,924, Cl. 424-240.000.
Freed, Meier E.; and Potoski, John R., to American Home Products Corporation. Preparation of 5,8-methano-5H-benzocyclohepten-10-amines. 3,966,815, Cl. 260-570.80R.
Freeman, Dalia: *See—*
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Freeman, Michael Alexander Reykers; Kempson, Geoffrey Edward; and Tuke, Michael Anthony, to National Research Development Corporation. Endoprosthetic bone joint device for the talo-navicular joint. 3,965,489, Cl. 3-1.910.
Fregnan, Gian Carlo: *See—*
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French Oil Mill Machinery Company, The: *See—*
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Frenzel, William K. Prosthetic device for holding golf clubs. 3,965,491, Cl. 3-12.800.
Frequency & Time Systems, Inc.: *See—*
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Frese, Stefan, to Siemens Aktiengesellschaft. Apparatus for the wireless transmission of a control signal to the control path of a controlled semiconductor valve. 3,967,244, Cl. 340-171.0PF.
Frevel, Ludo K.; and Kressley, Leonard J., to Dow Chemical Company, The. Gas treatment apparatus. 3,966,418, Cl. 23-284.000.
Freze, Benjamin H., to Challenge-Cook Bros., Incorporated. Lint disposal apparatus. 3,966,441, Cl. 55-290.000.
Frick, Siegmund; Gresser, Wilhelm; Meyer, Gunther; and Bier, Gerhard, to Dynamit Nobel Aktiengesellschaft. Polyvinylchloride polymer inhibited against release of hydrogen chloride at elevated temperature. 3,966,673, Cl. 260-42.490.
Friedman, Louis D., to Cogas Development Company. Waste water processing. 3,966,633, Cl. 252-373.000.
Friedrich, Helmut, to Vereinigte Flugtechnische Werke-Fokker Gesellschaft mit beschrankter Haftung. Apparatus for starting aircraft engines and for operating auxiliary on-board power generating equipment. 3,965,673, Cl. 60-39.140.
Friedrich Kocks GmbH: *See—*
Herchenroder, Hans, 3,965,682.
Friedrich Refrigerators Inc.: *See—*
Ansted, Roger C.; and Rodgers, Gerald L., 3,965,692.
Friend, Aaron D.; and Lindahl, Hilmer C., to R. G. LeTourneau, Inc. Propulsion control system for electrically powered vehicles. 3,967,171, Cl. 318-158.000.
Frischmann, Albert; Mermi, Kurt; Hermeneit, Rainer; and Koniger, Rudolf, to Upat-Max Langensiepen KG. Set of fixing elements for mounting radiators or like bodies on walls. 3,966,156, Cl. 248-201.000.
Froberg, Magnus L.; and Maddux, John F., to Owens-Corning Fiberglas Corporation. Apparatus and method for increasing furnace life in an electric furnace for thermoplastic materials. 3,967,046, Cl. 13-6.000.
Frodsham, E. Dale: *See—*
Reese, Raymond E., 3,966,067.
Frohlich, Alfons; and Cappel, Marie-Luise, to Opti-Holding AG. Slide-fastener stringer with warp-knit support tapes. 3,965,833, Cl. 112-265.000.
Frohlich, Peter E., to Bommer Spring Hinge Co. Inc. Adjustable door spring hinge with fixed minimum tension. 3,965,533, Cl. 16-189.000.
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Fudaley, Solly L. Proximity sensor with simultaneously active intermixed sensor types. 3,967,261, Cl. 340-258.00C.
Fuhrer, Jack Selig, to RCA Corporation. Velocity correction for video discs. 3,967,311, Cl. 358-8.000.
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Aonuma, Masashi; Tamai, Yasuo; and Akashi, Goro, 3,966,510.
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Fukui, Akio; Koike, Hiroshi; Tanaka, Takehiko; and Ito, Yuji, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Process for the preparation of 1-substituted anthraquinones. 3,966,775, Cl. 260-378.000.
Fukui, Masahiro; Hayashi, Shigeru; Okamoto, Takehiko; Koga, Isao; and Inoi, Takeshi, to Chisso Corporation. Catalytic preparation of ketones from aldehydes. 3,966,822, Cl. 260-593.00R.
Fukumaru, Toshitsugu: *See—*
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Fukunaga, Akio. Conduit valve. 3,965,929, Cl. 137-503.000.
Fukushima, Osamu; Matsumoto, Seiji; and Sato, Masamichi, to Rank Xerox Ltd. Separated roller liquid development. 3,965,861, Cl. 118-637.000.
Fukushima, Yoshikiyo; Momota, Kenzo; Shirahata, Hideaki; and Sakanai, Noriyuki, to Nippon Concrete Industries, Co., Ltd. Rail mounted apparatus for manufacturing concrete poles. 3,966,375, Cl. 425-62.000.
Furgalus, Keith A.; and Simmons, Harold C., to Parker-Hannifin Corporation. Ultrasonic spraying device. 3,966,120, Cl. 239-102.000.
Futaba Denshi Kogyo K.K.: *See—*
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Ashe, John B.; Berry, Peter F.; and Hall, James D., 3,967,122.
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Gabriel, Edwin Zenith. Duct system for wind gust alleviation of aircraft and suspended containerized loads. 3,966,144, Cl. 244-17.110.
Gagliani, John; and Long, John V., to International Harvester Company. Method of making foamed copolyimides and product obtained therefrom. 3,966,652, Cl. 260-2.50N.
Gagnon, Eugene G.; and Mao, Kao-Wen, to General Motors Corporation. Method of operating a dynamically packed bed electrode electrochemical cell system. 3,966,571, Cl. 204-149.000.
Gainesville Machine Company, Inc.: *See—*
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Ganz, Robert H. Package tightener and method. 3,965,645, Cl. 53-32.000.
Garbalizer Corporation of America: *See—*
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Garbe, Carl W., to Dames & Moore. Process for extracting dissolved salts from water. 3,966,539, Cl. 159-47.00R.
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Garrett, David W.: *See—*
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Garrett, Herbert V. Lightweight fence for protection against airborne snow, sand or the like. 3,966,172, Cl. 256-12.500.
Garrison, Marion A., to Empire Oil Tool Company. Inlet and outlet ports and sealing means for a fluid driven motor. 3,966,369, Cl. 418-149.000.
Gas Developments Corporation: *See—*
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Gault, William S.: *See—*
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Gauthier, William Kohlmann. Surgical retractor. 3,965,890, Cl. 128-20.000.
Gawlick, Heinz; Brede, Uwe; and Bendler, Hellmut, to Dynamit Nobel Aktiengesellschaft. Piezoelectric energy source. 3,967,141, Cl. 310-8.700.
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Gaylord, Norman G., to Atlantic Richfield Company. Preparation of carboxyl-containing polymers and composites thereof with hydroxyl-containing materials. 3,966,672, Cl. 260-42.140.
Gaynor, William Wayne; and Voigt, Gene Ray, to Ceres Ecology Corporation. Solid-liquid separator. 3,966,607, Cl. 210-137.000.
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Gee, Glen R., to Minnesota Mining and Manufacturing Company. Coiled edge guide for rod-tube signal device and method. 3,965,849, Cl. 116-114.500.
Geerk, Jens F., to Varian Mat GmbH. Mass spectrometer. 3,967,116, Cl. 250-298.000.
Geisel, Dennis M., to Mid America Sales Co., Inc. Electric cord hatch. 3,966,073, Cl. 220-3.800.
Gelardi, August P., to Raymond Lee Organization, Inc., The, a part interest. Casting fishing reel. 3,966,138, Cl. 242-84.20B.
Gelin, Robert J.; and Bartlett, James E., to Owens-Corning Fiberglas Corporation. Apparatus for and method of handling linear elements. 3,966,132, Cl. 242-36.000.
Gelin, Robert J., to Owens-Corning Fiberglas Corporation. Tension controlling apparatus. 3,966,133, Cl. 242-42.000.
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Gensler, William G. Method and apparatus for electrically determining plant water status. 3,967,198, Cl. 324-72.000.
George, Ivor Prosser. Vacuum grooming brush. 3,965,527, Cl. 15-396.000.
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Gerben, Ralph D., to Solo Cup Company. Cup filling and capping apparatus. 3,965,656, Cl. 53-282.000.

Gerecke, Max; Kaplan, Jean-Pierre; and Kyburz, Emilio, to Hoffmann-La Roche Inc. Fluoro-substituted dibenso[b,f] thiepins. 3,966,737, Cl. 260-268.0TR.
Germain, Michel: *See*—
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Ghyczy, Peter. Coupling piece. 3,966,338, Cl. 403-192.000.
Gibbs, James Whitman, to Flo-Start, Inc. Electrical control apparatus. 3,967,134, Cl. 307-115.000.
Gibbs, Orville J., to Bird Machine Company, Inc. Filter. 3,966,610, Cl. 210-203.000.
Gibbs, Orville J.; and Roos, John T., to Bird Machine Company, Inc. Filter. 3,966,611, Cl. 210-203.000.
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Giros, Marcel A., to Societe Meusienne de Constructions Mecaniques. Devices for continuously displacing a filamentary material in a treatment installation. 3,965,711, Cl. 72-39.000.
Gist-Brocades N.V.: *See*—
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Glaxo Laboratories Limited: *See*—
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Glazier, Frederick P.: *See*—
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Godai, Tomokazu; Sugiyama, Toboru; and Nishimura, Katushi, to Kobe Steel Ltd. Welding material for super low temperature steels. 3,966,424, Cl. 29-191.200.
Godbille, Etienne; and Tondu, Lucette, to Roussel-UCLAF. Chromatographic device. 3,966,609, Cl. 210-198.00C.
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Goetti, Hans; Mittler, Anton; and Forrer, Hermann, to Kammgarnspinnerei Buerglen. Method of making spun yarn. 3,965,664, Cl. 57-157.00R.
Goff, Richard E., Jr.; and Guay, Normand D., to Johnson & Johnson. Narrow elastic fabric for use as waistband in articles of apparel. 3,965,943, Cl. 139-421.000.
Goff, Richard E., Jr.; and Guay, Normand D., to Johnson & Johnson. Lightweight narrow elastic fabric. 3,965,944, Cl. 139-421.000.
Gohsler, Robert Edward. Tethered ball goal scoring game. 3,966,208, Cl. 273-101.000.
Goldberg, Arthur, to Howe Richardson Scale Company. Platform weighing scale. 3,966,001, Cl. 177-128.000.
Golden, Steven T. Portable, releasable tie-down device and method. 3,965,539, Cl. 24-71.300.
Goldstein, Avram; Leute, Richard K.; and Ullman, Edwin F., to Syva Company. Spin labeled compounds. 3,966,744, Cl. 260-292.000.
Goldstein, Avram; Leute, Richard K.; and Ullman, Edwin F., to Syva Company. Ligand determination of spin labeled compounds by receptor displacement-amphetamine analogs. 3,966,764, Cl. 260-326.850.
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Goldsworthy, William Brandt; and Hardesty, Ethridge E., to Goldsworthy Engineering, Inc. On-site wall structure formation. 3,966,533, Cl. 156-380.000.
Goloff, Alexander, to Caterpillar Tractor Co. Deflection compensation for slant axis rotary mechanisms. 3,966,366, Cl. 418-53.000.
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Gooch, John Henry, to J. H. Gooch & Company Limited. Pinch valve. 3,965,925, Cl. 137-451.000.
Gooch, Roland W., to Texas Instruments Incorporated. Process for fabrication and assembly of semiconductor devices. 3,965,568, Cl. 29-583.000.
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Gordon, Harry W.; and Schaffner, Carl P., to Schmid Laboratories, Inc. Method for treating hypercholesterolemia with N-acetyl candicidin. 3,966,911, Cl. 424-117.000.
Gordon, Harry W.: *See*—
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Gossage, Robert V., to Nalco Chemical Company. Recovery of tall oil soaps. 3,966,698, Cl. 260-97.500.
Gosser, Lawrence W., to Du Pont de Nemours, E. I., and Company. Method of making group VIII metal complex compounds. 3,966,595, Cl. 260-429.00R.
Goto, Kenji; Shibata, Norio; and Hashiguchi, Yukihide, to Toyota Jidosha Kogyo Kabushiki Kaisha. Misfire detecting apparatus for an internal combustion engine. 3,965,677, Cl. 60-277.000.
Goubau, George E. J., to Beam Guidance Inc. Antenna structures having reactance at free end. 3,967,276, Cl. 343-752.000.
Gould Inc.: *See*—
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Gowing, George A., to Bombardier Limited. Air intake silencer. 3,966,014, Cl. 181-35.00A.
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Graco Inc.: *See*—
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Grain Processing Corporation: *See*—
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Gramer, Eben J.; and Johnson, Melvin O. Method of heating a liquid and solar heating panel therefor. 3,965,887, Cl. 126-271.000.
Grammatica, Steven J.: *See*—
Page, Geoffrey A.; Grammatica, Steven J.; and Ewing, Joan R., 3,966,466.
Granberg, Elof. Lumber making attachment. 3,965,788, Cl. 83-745.000.
Grant, Frederic F., to Bell & Howell Company. Sheet advancing methods and apparatus. 3,966,190, Cl. 271-42.000.
Grant, Michael G. Oil-in-water monitor. 3,966,603, Cl. 210-86.000.
Graves, Harry Edwin. Apparatus for forming a jack-o-lantern. 3,965,574, Cl. 30-124.000.
Gray, Frederick W., to Colgate-Palmolive Company. Dishwashing compositions. 3,966,627, Cl. 252-99.000.
Gray, Michael David; and Kimber, Geoffrey Michael, to Coal Industry (Patents) Limited. Improvements in and relating to the production of coke. 3,966,584, Cl. 208-8.000.

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Grazen, Frank S.; Buike, Melvin L.; and Bryzinsky, Frank M., to Hooker Chemicals & Plastics Corporation. Friction particle for brake lining. 3,966,670, Cl. 260-38.000.

Greaves, Geoffrey Stuart; Deverill, Ian; and Bunce, Roger Abraham, to Vickers Limited. Device for use in producing a scanning beam of radiation and apparatus for use in investigating specimens. 3,966,322, Cl. 356-39.000.

Green, George Edward: *See—*
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Green, Hal, to Empire Automotive, Inc. Method of installing detachable sun roof panel for automobiles. 3,965,566, Cl. 29-451.000.

Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., to Millmaster Onyx Corporation. Quaternary ammonium co-polymers for controlling the proliferation of bacteria. 3,966,904, Cl. 424-78.000.

Greene, James L. Continuous-flow fluid pump. 3,966,360, Cl. 417-53.000.

Greene, Janice L., to Standard Oil Company. Process for producing 2-pyrrolidone. 3,966,763, Cl. 260-326.5FN.

Gregory, Gordon Ian: *See—*
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Gregory, M. Duane: *See—*
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Gregory, R. Kirk, to Symons Corporation. Latch-equipped, she-bolt gripper device for a concrete wall from tie rod. 3,965,542, Cl. 24-136.00R.

Grelle, Georgia I. Portable baby bathing and shampooing tray. 3,965,496, Cl. 4-185.00B.

Gresser, Wilhelm: *See—*
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Greuner, Bernd: *See—*
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Gridel, Joseph Y. Method of producing an absorbent, washable, protective mattress sheet and a sheet produced thereby. 3,965,503, Cl. 5-334.00R.

Grieb, Paul E.; and Sieradzki, Richard, to Textron, Inc. Control system for grinding machine. 3,965,621, Cl. 51-165.710.

Grimes Box Company, Inc.: *See—*
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Grimes, Brian A., to Grimes Box Company, Inc. Container partitioning. 3,966,111, Cl. 229-15.000.

Grip-Pak, Inc.: *See—*
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Grisebach, Hans Theodor, to Gewerkschaft Eisenhutte Westfalia. Control systems and arrangements for use in mineral mining installations. 3,965,797, Cl. 91-32.000.

Groenendaal, Willem; Taubert, Friedrich C.; Naber, Jaap E.; and Bekker, Gijsbertus A., to Shell Oil Company. Removal of sulfur oxides and particulate matter from waste gas streams. 3,966,879, Cl. 423-244.000.

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Gros, Eugene. Manufacture of articles of a substantially sack-like or tubular structure. 3,966,527, Cl. 156-250.000.

Groseclose, Pauline Inez. Blood-specimen procurement cart. 3,966,286, Cl. 312-258.000.

Gross, Bernard K. Means and method of drilling wells. 3,965,996, Cl. 175-57.000.

Gross, Erwin, to Standardwerk Eugen Reis GmbH. Coin storing and transferring apparatus. 3,965,912, Cl. 133-1.00R.

Gross, James R., to Dow Chemical Company, The. Absorbent articles and methods for their preparation. 3,966,679, Cl. 260-47.0EA.

Grosskopf, Rudolf, to Carl Zeiss-Stiftung. Method and means for electronic image analysis within a raster-scanned field. 3,967,053, Cl. 178-6.800.

Groth, Herbert D.: *See—*
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Gruffaz, Max; and Rollet, Bernard, to Rhone-Poulenc S.A. Maleic anhydride-polyaldimine prepolymers. 3,966,678, Cl. 260-47.0UA.

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Wittko, Joseph N.; Harding, David G.; Schneider, John J.; and Gonsalves, Joseph E., 3,966,147.

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Guilbaud, Jean-Pierre, to Ateliers Roannais de Constructions Textiles. Apparatus for treatment of tows for fibers by immersion in a liquid. 3,965,859, Cl. 118-428.000.

Guinosso, Charles J.: *See—*
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Gunnergaard, Marius, to Dansk Industri Syndikat A/S. Apparatus for the production of castings. 3,965,966, Cl. 164-213.000.

Gustafson, William Roy, to American Cyanamid Company. Shaped catalyst particles. 3,966,644, Cl. 252-455.00R.

Guthrie, Robert William; Hamilton, James Guthrie; Kierstead, Richard Wightman; Miller, O. Neal; and Sullivan, Ann Clare, to Hoffmann-La Roche Inc. Citric acid derivatives. 3,966,772, Cl. 260-348.00A.

Guthrie, Samuel Josepheus, to Teledyne, Inc. Method for manufacturing high voltage field-effect transistors. 3,966,515, Cl. 148-188.000.

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Gutmann, Walter; and Nicolet, Rene, to Lonza Ltd. Process for the preparation of transparent high impact strength vinyl chloride polymers. 3,966,846, Cl. 260-884.000.

Gyongyosi, Laszlo; and Lincoln, Paul A., to Ingersoll-Rand Company. Dust control hood and dust control system. 3,965,998, Cl. 175-209.000.

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Hada, Hiroshi; Hirayama, Tsutomu; and Nishida, Kazunori, to Nippon Electric Company, Ltd. Driving circuit for a gas discharge display panel. 3,967,157, Cl. 315-169.0TV.

Hadden, Stephen C.; and Hulls, Leonard R., to United States of America, Army. Sampling and dilution method. 3,965,749, Cl. 73-421.50R.

Hadley, Richard Marshall, to Harman International Industries, Inc. Remote control rearview mirror. 3,966,162, Cl. 248-487.000.

Hadzimahalis, Theodore M., to Bell & Howell Company. Molded control knob. 3,965,529, Cl. 16-121.000.

Haentjens, Walter D. Sump and pump construction for conveying solids in the form of a slurry. 3,966,262, Cl. 302-15.000.

Hagberg, Carl G., to Monsanto Company. Falling strand devolatilization apparatus. 3,966,538, Cl. 159-2.00R.

Hagen, Magnus F.; and Jordan, Fred A. Synchronized and precision sequencing of ball retainer relationship to the inner and outer slide members. 3,966,273, Cl. 308-3.800.

Hager, Robert E., to Westinghouse Electric Corporation. Current monitor circuits. 3,967,257, Cl. 340-253.00R.

Hahnke, Manfred: *See—*
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Haker, Edwin J.; Buelow, William H.; and Riddle, Charles F., to Rexnord Inc. Adjustable vibratory roller. 3,966,344, Cl. 404-117.000.

Hakkinen, Leo: *See—*
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Halasa, Adel Farhan, to Firestone Tire & Rubber Company, The. Polymerization of conjugated dienes with starved lithium, potassium or sodium catalyst. 3,966,691, Cl. 526-78.000.

Hale, Neville E., to Fathom Oceanology Limited. Apparatus for launching towing and recovering a submersible body from a vessel. 3,966,171, Cl. 254-190.00R.

Hale, Thomas Eugene, to General Electric Company. Coated cemented carbide product. 3,967,035, Cl. 428-336.000.

Hall, James D.: *See—*
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Ashe, John B.; Berry, Peter F.; and Hall, James D., 3,967,122.

Hall, John B.; Tseng, Ching Y.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., to International Flavors & Fragrances Inc. Alkyl esters of 2-methyl-4-pentenoic acid. 3,966,799, Cl. 260-486.00R.

Hall, Robert Arthur: *See*—
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Hallais, Jean Philippe; Humbert, Alain; and Schemali, Claude, to U.S. Philips Corporation. Method of growing by epitaxy from the vapor phase a material on substrate of a material which is not stable in air. 3,966,513, Cl. 148-175.000.

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Hannes, Karl; and Rossi, Paul C., to Coats & Clark, Inc. Cast articulated tool. 3,965,779, Cl. 81-416.000.

Hansen, Jens, to Blaupunkt-Werke GmbH. Circuit for storing the amplitude of the lower-frequency portion of a composite signal. 3,967,204, Cl. 325-473.000.

Hansen, Karl Erik; and Hansen, Ove, to Aktieselskabet Niro Atomizer. Method for producing agglomerated powders and apparatus for performing the method. 3,966,975, Cl. 426-285.000.

Hansen, Ove: *See*—
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Hara, Sumio: *See*—
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Harasta, Ruth P. Method of making water color pictures ready for framing. 3,966,532, Cl. 156-344.000.

Harben, Grover S., Jr., to Gainesville Machine Company, Inc. Poultry neck breaking machine. 3,965,534, Cl. 17-11.000.

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Hardy, David R.; and Weatherford, Richard C., to Kendall Company, The. Surgical sponge. 3,965,907, Cl. 128-296.000.

Hardy, Donald F., to Dart Industries Inc. Coating apparatus. 3,965,852, Cl. 118-8.000.

Hargis, Ivan Glen; and Livigni, Russell Anthony. Alkaline earth metal organometallic compounds, their preparation by metallation and catalysts comprising same. 3,966,638, Cl. 252-431.00R.

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Harper, Stanley Arthur, to RCA Corporation. Method for improving adherence of phosphor-photobinder layer during luminescent-screen making. 3,966,474, Cl. 96-36.100.

Harrington, Daniel Clayton, to Control Data Corporation. Transistor power and root computing system. 3,967,105, Cl. 235-197.000.

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Harrison, Charles W.; Mead, Theodore C.; Moreland, Howard R.; and Barger, Frank L., to Texaco Inc. Wax content measuring means. 3,965,723, Cl. 73-53.000.

Harruff, Robert J., to General Indicator Corporation. Numeric display using three endless belts. 3,965,593, Cl. 40-32.000.

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Harter, Robert M., deceased (by Harter, Patricia, executrix); and Russo, Gary L., to AVM Corporation. Valve assembly with plural flow path control. 3,966,119, Cl. 237-12.30B.

Hartung, Winfried, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Device for measuring pressure between cylinders of a printing press. 3,965,735, Cl. 73-141.00A.

Hartzler, Jon David, to Du Pont de Nemours, E. I., and Company. Aqueous organic base solution of polyhydrazides. 3,966,656, Cl. 260-29.20N.

Harvalik, Zaboj V. Integrated magneto-seismic sensor. 3,965,751, Cl. 73-432.00R.

Hasegawa, Haruo; Taniguchi, Hiroyoshi; Yamane, Shiro; Igawa, Takao; and Nagayama, Tomoshi, to Ricoh Co., Ltd. Electro photosensitive materials with a protective layer. 3,966,471, Cl. 96-1.500.

Hasei, Taeko. Adhesive label. 3,967,022, Cl. 428-40.000.

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Hatch, Donald M., to Hitco. Multi-ply woven article having stiffening elements between double plies. 3,965,942, Cl. 139-384.00R.

Hatch, Donald M.; and Lee, George D., to Hitco. Multi-ply woven article having acoustical elements between double plies. 3,966,013, Cl. 181-33.00G.

Hatch, Donald M.; and Lee, George D., to Hitco. Method of making woven acoustical panel. 3,966,522, Cl. 156-148.000.

Havener, Ralph L.; and Dunakey, Harry F., to Lectra Bike Corporation. Electricbike. 3,966,007, Cl. 180-34.000.

Hawkins, Carl V., III. Bottom fishing device. 3,966,151, Cl. 43-21.200.

Hawkins, Robert Stanley, to W. R. Grace & Co. Adjustable sealing device. 3,965,646, Cl. 53-112.00B.

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Hayakawa, Takeshi: *See*—
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Hayashi, Masaki; Kori, Seiji; Ohyama, Isao; and Endo, Hirofumi, to Ono Pharmaceutical Co., Ltd. Prostaglandin compounds. 3,966,792, Cl. 260-468.00D.

Hayashi, Shigeru: *See*—
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Hazelwood, John E. Combined vibratory feeder drive unit, vibratory feeder bowl, and parts separator. 3,966,040, Cl. 198-288.000.

Heat Research Corporation: *See*—
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Hecht, Victor. Muffler converter. 3,966,016, Cl. 181-57.000.

Heckenkamp, Edward B., to Allis-Chalmers Corporation. Release for breakaway coupling. 3,966,239, Cl. 285-316.000.

Heffron, Allan J.; Estry, Arthur L.; and Chalmers, William F., to C. M. Systems, Incorporated; and Crankshaft Machine. Crankshaft transfer mechanism. 3,966,058, Cl. 214-1.0BB.

Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
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Heighway, Edward A., to Atomic Energy of Canada Limited. Magnetic beam deflector system. 3,967,225, Cl. 335-210.000.

Heikkila, Viekko; Hakkinen, Leo; Strom, Rolf; Uusitalo, Leo; and Mellin, Juha, to OY Tampella AB Mechanical Workshops. Lubricating system of pressure fluid operated rock drill machines. 3,966,019, Cl. 184-7.00D.

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Heiman, Fred P.; and Schwippert, Guustaaf Arthur, to Mars, Inc. Phase sensitive coin discrimination method and apparatus. 3,966,034, Cl. 194-100.00A.

Heimes, Horst Peter; and Reul, Helmut, to Medac Gesellschaft fur Klinische Spezialpraparate mbH. Pump assembly. 3,966,358, Cl. 417-12.000.

Heinicke, Harald, to Siemens Aktiengesellschaft. Self-commutating inverter with controlled main valves in a center-tap circuit. 3,967,183, Cl. 321-45.00C.

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Heinzle, Otto. Slip form arrangement for constructing annular structures. 3,966,376, Cl. 425-63.000.

Hellmuth, Walter W.; Chafetz, Harry; and Cullen, William P., to Texaco Inc. Lube oil dispersant of improved odor and antioxidant properties. 3,966,622, Cl. 252-46.600.

Helm, Herbert W., to F. L. Smithe Machine Company, Inc. Method and apparatus for feeding inserts selectively. 3,966,186, Cl. 270-58.000.

Helmer, Karin Ulla Elisabet; and Reuterhall, Alf Ragnar, to Kemanord Aktiebolag. Composition for sizing cellulose fibers. 3,966,484, Cl. 106-287.00R.

Hendel, Robert J.: *See*—
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Mizuno, William G.; and Henderson, Iris N., 3,967,008.

Hendricks, Victor P. Electric flushing toilet bowl. 3,965,492, Cl. 4-79.000.

Hendrickx, Andreas J. J.; and van Duyl, Willem H., to Oce-Andeno B.V. Process for the preparation of substituted or unsubstituted 4-pyridylthioacetic acid. 3,966,741, Cl. 260-294.80G.

Henkel & Cie G.m.b.H.: *See*—
Andree, Hans; Koppensteiner, Gunther; and Stracke, Heinz-Ulrich, 3,966,968.

Hennart, Claude; Rabussier, Bernard; and Mandon, Jean-Pierre, to Airwick Industries, Inc. Evaporator system comprising a stabilized pesticidal phosphoric acid ester and method for stabilizing such ester enclosed in an evaporator. 3,966,900, Cl. 424-27.000.

Henning, Wolfgang: *See*—
Beaver, Ruby C.; Clasen, Theodor; Henning, Wolfgang; and Johnson, Emil S., 3,967,194.

Henrick, Clive A.: *See*—
Willy, William E.; and Henrick, Clive A., 3,966,969.

Henry, Clemence J.: *See*—
Krug, Robert H.; and Henry, Clemence J., 3,966,623.

Henry, William F.; Templeman, Gareth J.; Gorman, Roger A.; and Pinaire, Lawrence, to Pillsbury Company, The. Process for determining and controlling the moisture of food products. 3,966,973, Cl. 426-231.000.

Herbert, Daniel H. Dewatering and classifying apparatus. 3,966,592, Cl. 209-462.000.

Herbert, Werner, to Dornier System GmbH. Process for manufacturing hollow-cylindrical rotors. 3,966,507, Cl. 148-12.00R.

Herchenroder, Hans, to Friedrich Kocks GmbH. Hydraulic installation, more particularly for driving warping retaining winches on bulk cargo ships. 3,965,682, Cl. 60-420.000.

Hercules Incorporated: *See*—
Aldrich, Paul H., 3,966,654.
Espy, Herbert H.; and Putnam, Stearns T., 3,966,684.
Espy, Herbert H.; and Putnam, Stearns T., 3,966,694.

Hermann, James F., to S. C. Johnson & Son, Inc. Disposable floor polishing wipe. 3,965,519, Cl. 15-104.930.

Hermeneit, Rainer: *See*—
Frischmann, Albert; Mermi, Kurt; Hermeneit, Rainer; and Koniger, Rudolf, 3,966,156.

Herment, Robert; Lafage, Yves; Emo, Jean Claude; and Yurcek, Jean Marie, to Shell Oil Company. Production of briquettes. 3,966,427, Cl. 44-10.00H.

Herring, William M.; and Walling, Dennis B., to Standard Oil Company. Multi-counter register. 3,967,095, Cl. 235-92.0EA.

Herrmann, Manfred Franz: *See*—
Satzinger, Gerhard; and Herrmann, Manfred Franz, 3,966,779.

Herrmann, Wolfgang Dieter: *See*—
Satzinger, Gerhard; and Herrmann, Wolfgang Dieter, 3,966,813.

Hersberger, Pierre: *See*—
Scherrer, Igor; and Hersberger, Pierre, 3,965,667.

Hertzenberg, Elliot P.: *See*—
Derolf, M. Robert; and Hertzenberg, Elliot P., 3,966,893.

Hess, Hans-Jurgen E.: *See*—
Cronin, Timothy H.; and Hess, Hans-Jurgen E., 3,966,936.

Hesston Corporation: *See*—
Jones, Joel Flynn, 3,966,065.

Hester, Jackson B., Jr., to Upjohn Company, The. 6-Pyridyl benzodiazepines antidepressants. 3,966,943, Cl. 424-263.000.

Hewlett-Packard Company: *See*—
Roy, Jean Claude, 3,967,266.

Hiab-Foco Aktiebolag: *See*—
Lindqvist, Jonas Herman, 3,966,249.

Hickle, Jerry J., to R. L. Kuss & Co., Inc. Plastic film connector for inflatable structures. 3,965,546, Cl. 24-243.00K.

Higgins, Robert B.: *See*—
Mason, Donald G.; and Higgins, Robert B., 3,966,608.

Hild, Henry F.: *See*—
Rosenberg, David M.; Hild, Henry F.; and Stearley, John W., 3,965,755.

Hilding, Jonas Olof Anders, to Atlas Copco Aktiebolag. Magazine for storing drill string elements. 3,965,994, Cl. 175-52.000.

Hilding, Jonas Olof Anders; and Persson, Jan Edvard, to Atlas Copco Aktiebolag. Method and apparatus for guiding and sealing a drill string. 3,965,997, Cl. 175-65.000.

Hill-Rom Company, Inc.: *See*—
Stein, William H., Jr., 3,965,500.

Hills Research & Development, Inc.: *See*—
Hills, William H.; and Hills, Shirley M., 3,965,642.

Hills, Shirley M.: *See*—
Hills, William H.; and Hills, Shirley M., 3,965,642.

Hills, William H.; and Hills, Shirley M., to Hills Research & Development, Inc. Method and apparatus for filling plastic bags with liquid or particulate material. 3,965,642, Cl. 53-28.000.

Hilscher, Eduard: *See*—
Becker, Theo; Hilscher, Eduard; and Ott, Karl-Heinz, 3,965,953.

Himmele, Walter: *See*—
Aquila, Werner; Himmele, Walter; Fliege, Werner; and Siegel, Hardo, 3,966,827.

Himmelweit, Fred: *See*—
Chain, Ernst Boris; Buck, Kenneth William; Darbyshire, Joan Elizabeth; Banks, Geoffrey Talbot; Himmelweit, Fred; and Ratti, Giulio, 3,966,707.

Hinata, Masanao; Takei, Haruo; Ikeda, Tadashi; Ogawa, Akira; Sato, Akira; and Iwamoto, Atsuo, to Fuji Photo Film Co., Ltd. Spectrally sensitized silver halide photographic emulsion. 3,966,477, Cl. 96-124.000.

Hindin, Saul G.; and Pond, George R., to Engelhard Minerals & Chemicals Corporation. Method of combustion using high temperature stable catalysts. 3,966,391, Cl. 431-7.000.

Hindin, Saul G.; and Pond, George R., to Engelhard Minerals & Chemicals Corporation. Compositions and methods for high temperature stable catalysts. 3,966,790, Cl. 252-465.000.

Hinkley, David William, to International Oils Exploration N.L. Apparatus for the carbonization of coal. 3,966,561, Cl. 202-117.000.

Hinton, Charles V.; Troutman, Kenneth W.; and Ferguson, Richard, to Terrell Machine Company, The. Filling bobbin inspection device. 3,966,591, Cl. 209-73.000.

Hirakawa, Michio: *See*—
Yamaguchi, Tadashi; Ono, Takayuki; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, 3,967,006.

Hirayama, Tsutomu: *See*—
Hada, Hiroshi; Hirayama, Tsutomu; and Nishida, Kazunori, 3,967,157.

Hirose, Yoshihiko: *See*—
Nomura, Kousi; Kawazu, Satoru; Hirose, Yoshihiko; Inoue, Isao; Watari, Yoshihiko; and Kijima, Koichi, 3,966,501.

Hirsch, Horst E.: *See*—
Crossley, Cecil L.; Hirsch, Horst E.; and Liang, Shou C., 3,966,568.

Hirwe, Asha: *See*—
Metcalf, Robert L.; Kapoor, Inder; and Hirwe, Asha, 3,966,824.

Hitachi Chemical Company, Ltd.: *See*—
Nakano, Mineo; Koyama, Takeshi; Matsumoto, Yoshiro; and Maruoka, Akira, 3,966,390.

Hitachi, Ltd.: *See*—
Horiuchi, Masatada; Tokuyama, Takashi; and Miyazaki, Takao, 3,967,310.
Inoyama, Tadao, 3,965,562.
Isoo, Osamu; Matsuoka, Shinji; Matsuoka, Shigeru; Uno, Takeshi; Ikeda, Sadahiro; Masuda, Ikuro; and Kurokawa, Koji, 3,967,242.
Kanuma, Yoji, 3,967,087.
Matsuoka, Yoshio; Inomata, Hiroshi; Shimazaki, Tsuneo; and Takahata, Fujiya, 3,966,323.
Miyata, Kenzi, 3,967,309.
Moriyama, Hiromi; and Kuwabara, Motosuke, 3,967,075.
Nomura, Masahide, 3,965,684.
Nonaka, Yasuhiko, 3,966,512.
Shirasu, Hirotoshi; and Usuda, Hirotaka, 3,967,071.
Toriyama, Kazuhisa; Abe, Hidetoshi; Nakano, Fumio; Murao, Kenji; and Sato, Mikio, 3,966,631.
Yatsuo, Tsutomu; Kamei, Tatsuya; Ogawa, Takuzo; and Tanaka, Tomoyuki, 3,967,308.

Hitco: *See*—
Hatch, Donald M., 3,965,942.
Hatch, Donald M.; and Lee, George D., 3,966,013.
Hatch, Donald M.; and Lee, George D., 3,966,522.

Hitzman, Donald O., to Phillips Petroleum Company. Microbial synthesis from aldehyde containing hydrocarbon derived products. 3,965,985, Cl. 166-275.000.

Hobbs, Milton M.; and Kiscaden, Roy, to Westinghouse Electric Corporation. Combined cycle electric power plant and a gas turbine having a backup control system with an improved feedforward analog speed/load control. 3,965,674, Cl. 60-39.18B.

Hochberg, Arthur K., to TRW Inc. Dielectrically isolated semiconductor devices. 3,966,577, Cl. 204-192.000.

Hochstrasser, Jurgen: *See—*
Mathieu, Hans; and Hochstrasser, Jurgen, 3,965,999.

Hochstrasser nee Wack, Elisabeth: *See—*
Mathieu, Hans; and Hochstrasser, Jurgen, 3,965,999.

Hodges, Newton John: *See—*
Blunt, Geoffrey Vincent Dallow; and Hodges, Newton John, 3,966,653.

Hodgson, Brian P.: *See—*
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Hoechst Aktiengesellschaft: *See—*
Becker, Theo; Hilscher, Eduard; and Ott, Karl-Heinz, 3,965,953.
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 3,966,400.
Brandt, Wilhelm; and Bindrum, Irmgard, 3,967,044.
Lademann, Rudolf; Lindner, Helmut; Martini, Thomas; and Rammelt, Peter Paul, 3,966,832.
Meininger, Fritz; Hunger, Klaus; and Springer, Hartmut, 3,966,704.
Mohr, Reinhard; and Hahnke, Manfred, 3,966,405.
Noetzel, Siegfried; Jastrow, Horst; and Fischer, Edgar, 3,966,849.
Plotz, Kurt; Breschar, Klaus; and Klein, Albert, 3,967,032.
Rochling, Hans; and Hartel, Kurt, 3,966,932.
Trosken, Jurgen, 3,966,826.
Vogt, Wilhelm; Neumaier, Hubert; Schallus, Erich; and Peantek, Gunter, 3,966,803.
Wegner, Gunther, 3,965,577.

Hoechst Fibers Incorporated: *See—*
Beam, John A.; and Bane, John D., 3,966,221.

Hoehn, Hans; and Denzel, Theodor, to E. R. Squibb & Sons, Inc. Amino derivatives of pyrazolopyridine carboxamides. 3,966,746, Cl. 260-293.600.

Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lother; Behrenz, Wolfgang; Hammann, Ingeborg; Stendel, Wilhelm; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Pyrimidin(4)-yl-(thiono)-(thiol)-phosphoric-(phosphonic)-acid esters. 3,966,730, Cl. 260-251.00P.

Hoffman, Louis S.; and Lutz, Michael, to Dillon-Beck Manufacturing Company. Containers for the bulk packaging of articles. 3,966,083, Cl. 220-306.000.

Hoffmann-La Roche Inc.: *See—*
Chodnekar, Madhukar Subraya; Loeliger, Peter; Pfiffner, Albert; Schwieter, Ulrich; Suchy, Milos; and Zurfluh, Rene, 3,966,780.
Gerecke, Max; Kaplan, Jean-Pierre; and Kyburz, Emilio, 3,966,737.
Guthrie, Robert William; Hamilton, James Guthrie; Kierstead, Richard Wightman; Miller, O. Neal; and Sullivan, Ann Clare, 3,966,772.
Leimgruber, Willy; and Weigele, Manfred, 3,966,791.
Surmatis, Joseph Donald, 3,966,734.

Hofmann, Corris Mabelle; and Safir, Sidney Robert, to American Cyanamid Company. Para-fluorophenyl-N-heterocyclic substituted butanes. 3,966,748, Cl. 260-294.80D.

Hofmeister, Helmut; Laurent, Henry; Wiechert, Rudolf; Annen, Klaus; and Steinbeck, Hermann, to Schering Aktiengesellschaft. 11β-fluoroandrostenes. 3,966,713, Cl. 260-239.55R.

Hogan, James Edward. Soldering aid. 3,966,109, Cl. 228-52.000.

Hoglen, Edward L.: *See—*
Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., 3,966,104.

Hokushin Electric Works, Ltd.: *See—*
Watanabe, Masayasu, 3,965,738.

Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., to Dayco Corporation. Apparatus for severing reinforced elastomeric conduit. 3,966,104, Cl. 225-96.000.

Holland, Thomas K.: *See—*
Howes, Bruce; and Holland, Thomas K., 3,966,396.

Holland, William Henry: *See—*
Noakes, Michael Lesney; Caesar, Wilfred George; Holland, William Henry; and Hancock, Norman Herbert, 3,966,646.

Hollenberg, Glenn W.; and Crane, Robert L., to United States of America, Air Force. Method of fabricating silicon carbide articles. 3,966,855, Cl. 264-65.000.

Hollis, Clinton R., to International Paper Company. Stepped and angle-cut, pinch closure. 3,966,115, Cl. 229-55.000.

Hollis, David L., to Corning Glass Works. Automatic focusing system. 3,967,108, Cl. 250-201.000.

Hollis Engineering, Inc.: *See—*
Boynton, Kenneth G., 3,966,110.

Hollister, Ralph O.; and Sanders, Ernest E. Free-standing golf club and golf ball carrier. 3,966,051, Cl. 211-14.000.

Holmes, Alton B.: *See—*
Anderson, Bruce D.; and Holmes, Alton B., 3,966,028.

Holosonics, Inc.: *See—*
Thatcher, John B., 3,967,214.

Holte, Paul C., to Auric Corporation. Selective plating apparatus. 3,966,581, Cl. 204-202.000.

Homeyer, Bernhard: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lother; Behrenz, Wolfgang; Hammann, Ingeborg; Stendel, Wilhelm; and Homeyer, Bernhard, 3,966,730.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Sakurai, Yoshitoshi; Okura, Takao; and Tanaka, Miniru, 3,965,881.

Honer, Harold Nickolas, to ESB Incorporated. Seawater battery. 3,966,497, Cl. 136-90.000.

Honeywell Information Systems, Inc.: *See—*
Fett, Darrell L., 3,967,101.
Johnson, Robert B.; Feldman, Paul S.; and Fisher, Edwin P., 3,967,139.

Honkomp, Leroy J.: *See—*
Schwan, Thomas J.; Davis, Charles S.; and Honkomp, Leroy J., 3,966,760.

Honnorat, Yves C.; Raisson, Gerard D.; and Morlet, Jean G., to Creusot-Loire. Apparatus for the manufacture of spherical metallic powder non-contaminated by ambient atmosphere. 3,966,374, Cl. 425-7.000.

Hooker Chemicals & Plastics Corporation: *See—*
Grazen, Frank S.; Buike, Melvin L.; and Bryzinsky, Frank M., 3,966,670.

Hope, Henry F.; and Hope, Stephen F. Controllable pumps. 3,965,758, Cl. 74-41.000.

Hope, Henry F.; and Hope, Stephen F. Strip straightening apparatus, product and method. 3,966,868, Cl. 264-238.000.

Hope, Stephen F.: *See—*
Hope, Henry F.; and Hope, Stephen F., 3,965,758.
Hope, Henry F.; and Hope, Stephen F., 3,966,868.

Hopkins, Brian D., to Mead Johnson & Company. Annular collar safety closure. 3,966,082, Cl. 220-306.000.

Hopkins, Gary L.: *See—*
McNinch, Joseph H., Jr.; Urban, John A.; and Hopkins, Gary L., 3,966,267.

Horiguchi, Kazuo, to Susmu Industrial Co., Ltd. Method of processing an organic high molecular weight film. 3,966,999, Cl. 427-41.000.

Horiguchi, Sadayuki: *See—*
Ito, Akiro; Ichikawa, Yasushi; Horiguchi, Sadayuki; Shirota, Shyoji; Kayama, Yasuo; Chihara, Shiro; Haneda, Isoko; Hasuda, Katsumi; and Takano, Shyoichi, 3,966,913.

Horikawa, Hiroumi: *See—*
Torii, Kenji; Ozawa, Tatsuya; Ono, Kimio; Iwabe, Koichi; and Horikawa, Hiroumi, 3,966,903.

Horiuchi, Kotaro, to Yamaha, Hatsudoki Kabushiki Kaisha. Sectional boat structures. 3,965,513, Cl. 9-25.000.

Horiuchi, Masao, to Matsushita Electric Industrial Co., Ltd. Gap detector for microwave oven. 3,967,088, Cl. 219-10.55C.

Horiuchi, Masatada; Tokuyama, Takashi; and Miyazaki, Takao, to Hitachi, Ltd. Semiconductor device having controlled surface charges by passivation films formed thereon. 3,967,310, Cl. 357-54.000.

Horton, Edward E., to Deep Oil Technology, Inc. Method and apparatus for laying continuous pipe. 3,965,713, Cl. 72-146.000.

Horton, James B.: *See—*
Townsend, Herbert E., Jr.; Horton, James B.; and Woodyatt, Louis R., 3,966,421.

Hoscher, Rudolf: *See—*
Sernetz, Heinz; Puhringer, Othmar; and Hoscher, Rudolf, 3,965,974.

Hoshi, Hiroshi: *See—*
Yamaguchi, Tadashi; Ono, Takayuki; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, 3,967,006.

Hoshide, Yasuo: *See—*
Tomioka, Tatsuo; Hoshide, Yasuo; Ogawa, Hirosi; and Suzuki, Kenichi, 3,966,720.

Hosokawa, Toshio: *See—*
Kidoh, Kunizoh; Kashio, Hidetora; Hosokawa, Toshio; and Kusida, Kazuo, 3,966,696.

Hotchkiss, Kenneth W.; and Kopp, George A., Sr., to Proto Production Plastics, Inc. Terminal box and cover. 3,966,074, Cl. 220-3.800.

House, Bennie L. Tractor mountable adjustable high volume water pump. 3,966,361, Cl. 417-231.000.

House, Frederick Glenn, to Bell Telephone Laboratories, Incorporated. Digital computer arrangement for communicating data via data buses. 3,967,246, Cl. 340-172.500.

Hout, Chester L. Variable resistor with plug-in resistance element. 3,967,231, Cl. 338-117.000.

Howard, Gerald T. Magnetic motion conversion device. 3,967,146, Cl. 310-80.000.

Howe Richardson Scale Company: *See—*
Goldberg, Arthur, 3,966,001.

Howell, Colvard W. Signal light. 3,967,274, Cl. 340-380.000.

Howes, Bruce; and Holland, Thomas K., to F. P. Licensing Co., Inc. Textile printing process and transfer medium. 3,966,396, Cl. 8-2.50A.

Howlett, Richard Martin: *See—*
Elliott, John Scotchford; Davis, Bryan Terence; and Howlett, Richard Martin, 3,966,807.

Howmedica, Inc.: *See—*
Murray, Ian P.; and Forte, Mark R., 3,965,490.

Hoya Glass Works, Ltd.: *See—*
Asahara, Yoshiyuki; and Izumitani, Tetauro, 3,966,447.
Asahara, Yoshiyuki; Izumitani, Tetsuro; and Nakagawa, Kenji, 3,966,448.

Hozumi, Yukio: *See*—
Sonoyama, Yuzo; Ohi, Akira; and Hozumi, Yukio, 3,966,677.

Hruza, Denis E.: *See*—
Pittet, Alan O.; Pascale, John V.; and Hruza, Denis E., 3,966,989.

Hrvoic, Ivan; and Humski, Kresimir. Nuclear magnetometers for earth's field measurements based on dynamic polarization of nuclei and free radical substance for use therein. 3,966,409, Cl. 23-230.00R.

Huang, Kuo P.; and Walsh, John J., III, to Westinghouse Electric Corporation. Nozzle chamber friction damper. 3,966,023, Cl. 188-1.00B.

Hubbard, Robert William: *See*—
Hutchings, Bernard David Francis; and Hubbard, Robert William, 3,965,733.

Huber, Eugen. Paneling for walls or the like. 3,965,636, Cl. 52-496.000.

Huber, Ludwig Konrad, to Pennwalt Corporation. Process for controlling bacteria with tetrahydro-1,3-thiazinium salts. 3,966,929, Cl. 424-246.000.

Hudson, Jimmie E.; and Dockery, Calvin D., to Phillips Petroleum Company. Process for using a contoured assist plug for thermoforming oriented articles. 3,966,860, Cl. 264-94.000.

Hudson, Ralph B., Jr.: *See*—
Suggitt, Robert M.; Gates, Walter C., Jr.; and Hudson, Ralph B., Jr., 3,966,828.

Huf, Franz, to Dornier System GmbH. Rotary piston machine for transporting liquid or gaseous media. 3,966,370, Cl. 418-183.000.

Huff, Roger K., to Ciba-Geigy Corporation. Oxa- and thia-diazin-2-ones. 3,966,721, Cl. 260-243.00R.

Hug, Alfred Jean Theodore, to ARFINA Anstalt fur Continentale und Vebersee-Finansinteressen. Electrical connector mounted on a support plate. 3,966,291, Cl. 339-64.00R.

Hughes Aircraft Company: *See*—
Chapman, Arthur S., 3,966,298.
Robusto, Paul F.; and Stephens, Craig P., 3,967,151.
Somogyi, Bela, 3,965,665.

Hughes, Jack: *See*—
Uht, Frank O., 3,965,838.

Hughes, John Lawrence; Seyler, Jay Kenneth; and Smith, Carroll M., to Armour Pharmaceutical Company. 1-(α-Aminomethylbenzyl-)isoquinoline compounds. 3,966,724, Cl. 260-247.5GP.

Hulls, Leonard R.: *See*—
Hadden, Stephen C.; and Hulls, Leonard R., 3,965,749.

Humbert, Alain: *See*—
Hallais, Jean Philippe; Humbert, Alain; and Schemali, Claude, 3,966,513.

Humphrey Elevator and Truck Company: *See*—
Plitzkow, Howard G., 3,966,027.

Humphrey, Robert Walter: *See*—
Watkins, Robert Charles; Kinghan, Derek Alfred; and Humphrey, Robert Walter, 3,966,621.

Humski, Kresimir: *See*—
Hrvoic, Ivan; and Humski, Kresimir, 3,966,409.

Hunger, Klaus: *See*—
Meininger, Fritz; Hunger, Klaus; and Springer, Hartmut, 3,966,704.

Hunsucker, Jerry H., to Commercial Solvents Corporation. Process for dyeing glass textiles. 3,967,015, Cl. 427-386.000.

Hunt, James P.: *See*—
Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., 3,966,104.

Hunter, Don L.: *See*—
Woods, William G.; and Hunter, Don L., 3,966,816.

Hunter, Edwin J., to Toro Company, The. Water powered drive for automatic controllers. 3,965,800, Cl. 91-336.000.

Hunter, George L. K.; Krampl, Victor; Malone, Charles Thomas; and Usher, Gerald Edward, to Tenco Brooke Bond Limited. Method for enhancing tea flavor and product thereof. 3,966,986, Cl. 426-534.000.

Hunter, Ronald Bruce. Seating cushion. 3,965,508, Cl. 5-368.0WB.

Hunziker, John, Jr., to United States of America, Health, Education and Welfare. Laboratory mouse feeder. 3,965,868, Cl. 119-52.00R.

Hurco Manufacturing Company, Inc.: *See*—
Roch, Gerald V., 3,965,721.

Hutchings, Bernard David Francis; and Hubbard, Robert William, to Pye Limited. Crane load inidicating arrangement. 3,965,733, Cl. 73-133.00R.

Hutchins, Alma A. Straight line abrading tool. 3,965,801, Cl. 91-351.000.

Hutter Rudolf G. E., to GTE Laboratories Incorporated. Simultaneous electrostatic focusing and deflection system. 3,967,152, Cl. 313-435.000.

Huvey, Michel: *See*—
Bonavent, Gerard; and Huvey, Michel, 3,966,388.

Hydril Company: *See*—
Lewis, George E., 3,966,235.

Hyland, Anthony Joseph; and Crossley, Wade William, to Elco Corporation. Terminating apparatus for flat conductor cables. 3,966,295, Cl. 339-176.0MF.

Hyner, Jacob; and Michelson, Robert A., to Whyco Chromium Company Inc. Method of electrodepositing an alloy of tin, cobalt and a third metal and electrolyte therefor. 3,966,564, Cl. 204-43.00S.

Hyslop, Ian Willoughby, to West Rand Engineering Works (Proprietary) Ltd. Air line lubricators and the like. 3,966,021, Cl. 184-56.00R.

Ichikawa, Yasushi: *See*—
Ito, Akiro; Ichikawa, Yasushi; Horiguchi, Sadayuki; Shirota, Shyoji; Kayama, Yasuo; Chihara, Shiro; Haneda, Isoko; Hasuda, Katsumi; and Takano, Shyoichi, 3,966,913.

Ichikawa, Yataro; Yamanaka, Yoshiyuki; and Tsuruta, Hideki, to Teijin Limited. Novel process for preparation of 4-hydroxy-2,4,6-trimethyl-2,5-cyclohexadiene-1-one. 3,966,818, Cl. 260-586.00P.

Igarashi, Yuriko; and Kakutani, Haruko, to Kureha Kagaku Kogyo Kabushiki Kaisha. Stable electret retaining a high surface potential and method of making the same. 3,967,027, Cl. 428-212.000.

Igarashi, Yuriko: *See*—
Takahashi, Masaaki; Ito, Akira; and Igarashi, Yuriko, 3,966,674.

Igawa, Takao: *See*—
Hasegawa, Haruo; Taniguchi, Hiroyoshi; Yamane, Shiro; Igawa, Takao; and Nagayama, Tomoshi, 3,966,471.

Ihringer, Gerhard, to Rodi & Wienenberger, Aktiengesellschaft. Expansion bracelet. 3,965,670, Cl. 59-79.00R.

IIT Research Institute: *See*—
Camras, Marvin, 3,967,318.

Ikeda, Sadahiro: *See*—
Isoo, Osamu; Matsuoka, Shinji; Matsuoka, Shigeru; Uno, Takeshi; Ikeda, Sadahiro; Masuda, Ikuro; and Kurokawa, Koji, 3,967,242.

Ikeda, Tadashi: *See*—
Hinata, Masanao; Takei, Haruo; Ikeda, Tadashi; Ogawa, Akira; Sato, Akira; and Iwamoto, Atsuo, 3,966,477.

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Jahnsen, Vilhelm J., to California Institute of Technology. Group extraction of organic compounds present in liquid samples. 3,966,410, Cl. 23-230.00B.
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James, Edward William, II; and Kenney, Warren Eugene, to Du Pont de Nemours, E. I., and Company. Crimper startup method and system. 3,965,548, Cl. 28-1.700.

James, Loyal W. Safety door lock. 3,966,248, Cl..292-340.000.
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Kurobe, Moriji; Araga, Toshimi; Ito, Nobuhiro; Sato, Shigeyuki; and Takahashi, Hidero, 3,967,045.

Kabushiki Kaisha Tsuchiya: *See—*
Okano, Ryoichi; Bunda, Tsuchio; Mizusawa, Shinichiro; and Morita, Akiyoshi, 3,966,443.

Kadono, Takeji: *See—*
Inamoto, Yoshiaki; Kadono, Takeji; and Takaishi, Naotake, 3,966,800.

Kagan, Morton R.: *See—*
Schain, David B.; and Kagan, Morton R., 3,966,205.

Kaiser, Carl; and Ross, Stephen T., to SmithKline Corporation. 4-Hydroxy-α-[(3,4-methylenedioxyphenyl)isopropylaminoethyl]-3-(methylsulfonylmethyl)benzyl alcohol. 3,966,770, Cl. 260-340.500.

Kajinaga, Yoshihiro: *See—*
Ito, Shunji; Morioka, Yasuaki; Kajinaga, Yoshihiro; Nitta, Minoru; and Sakurada, Ichio, 3,966,454.

Kakeda, Teruyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Liquid crystal display device. 3,966,304, Cl. 350-160.0LC.

Kakuta, Hisashi; Matoba, Shigetada; Shimizu, Kenichi; and Yamashita, Satoshi, to Asahi Glass Co., Ltd. Process for the recovery of selenium from waste gas. 3,966,889, Cl. 423-510.000.

Kakutani, Haruko: *See—*
Igarashi, Yuriko; and Kakutani, Haruko, 3,967,027.

Kalach, Vladimir Sergeevich; and Burlakova, Lidia Ivanovna. Method of processing of waste gases. 3,966,877, Cl. 423-240.000.

Kali-Chemie Aktiengesellschaft: *See—*
Milkowski, Wolfgang; Zeugner, Horst; von Eickstedt, Klaus-Wolf; and Stuhmer, Werner, 3,966,735.

Kallianidis, Milton: *See—*
Klein, Gerhart P.; and Kallianidis, Milton, 3,967,000.

Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to L'Oreal. Indamines for dyeing keratinous fibers. 3,966,722, Cl. 260-244.00R.

Kameda, Nobuyuki: *See—*
Oishi, Tadashi; Kameda, Nobuyuki; Kato, Toshiro; Fujinami, Akira; Ozaki, Toshiaki; and Itooka, Eiyashi, 3,966,789.

Kamei, Tatsuya: *See—*
Yatsuo, Tsutomu; Kamei, Tatsuya; Ogawa, Takuzo; and Tanaka, Tomoyuki, 3,967,308.

Kamigaito, Osami; Doi, Haruo; Masaki, Hideyuki; Kandori, Toshio; Oki, Masami; and Nakamura, Yasuo, to Nippondenso Co., Ltd.; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Resistor built-in spark plug. 3,967,230, Cl. 338-66.000.

Kaminski, James J.; and Bodor, Nicolae S., to Interx Research Corporation. N-chloro-amino acid derivatives activity. 3,966,796, Cl. 260-482.00R.

Kaminsky, Daniel, to Warner-Lambert Company. 2H-1,3,2-dioxaborino-[5,4-c]-1,2-benzo-thiazine 6,6-dioxides. 3,966,716, Cl. 260-243.00R.

Kammgarnspinnerei Buerglen: *See—*
Goetti, Hans; Mittler, Anton; and Forrer, Hermann, 3,965,664.

Kammgarnspinnerei Burglen: *See—*
Goetti, Hans; Mittler, Anton; and Forrer, Hermann, 3,965,663.

Kamp, Ewald Albert: *See—*
Troy, Marion Frank; and Kamp, Ewald Albert, 3,966,858.

Kampe, Wolfgang; Fauland, Erich; Stach, Kurt; Stork, Harald; and Schmidt, Felix Helmut, to Boehringer Mannheim G.m.b.H. N(6)-disubstituted adenoisine compounds and therapeutic compositions. 3,966,916, Cl. 424-180.000.

Kampf, Wolfgang; and Nordsiek, Karl-Heinz, to Chemische Werke Huls Aktiengesellschaft. Production of high-vinyl group, high-molecular weight unsaturated hydrocarbon polymers. 3,966,697, Cl. 526-93.000.

Kanatani, Yoshiharu; Ise, Masahiro; and Mizukami, Etsuo, to Sharp Kabushiki Kaisha. Photo-image memory panel and activating method thereof. 3,967,112, Cl. 250-213.00R.

Kanda, Kaoru: *See—*
Taniyama, Yukio; Isaka, Tetsuo; Nagahori, Tetsuo; and Kanda, Kaoru, 3,967,249.

Kandori, Toshio: *See—*
Kamigaito, Osami; Doi, Haruo; Masaki, Hideyuki; Kandori, Toshio; Oki, Masami; and Nakamura, Yasuo, 3,967,230.

Kanebo, Ltd.: *See—*
Nishida, Takeshi; Shiromaru, Isao; and Teshima, Tsutomu, 3,966,865.

Kanengieter, Glenn G.; and Barry, Gerald E., to Owatonna Manufacturing Company, Inc. Stack forming apparatus. 3,965,660, Cl. 56-344.000.

Kanuma, Yoji, to Hitachi, Ltd. Sealing structures for the output portions of magnetrons. 3,967,087, Cl. 219-10.55B.

Kao Soap Co., Ltd.: *See—*
inamoto, Yoshiaki; Kadono, Takeji; and Takaishi, Naotake, 3,966,800.

Kaplan, Jean-Pierre: *See—*
Gerecke, Max; Kaplan, Jean-Pierre; and Kyburz, Emilio, 3,966,737.

Kaplan, John J.; Richert, Wilhelm H.; and Trumblee, John W., to Jo-Bi Farms, Inc. Poultry leg boning machine. 3,965,535, Cl. 17-1.00G.

Kapoor, Inder: *See—*
Metcalf, Robert L.; Kapoor, Inder; and Hirwe, Asha, 3,966,824.

Karami, Hamzeh, to Colgate-Palmolive Company. Absorbent article with pattern and method. 3,965,906, Cl. 128-287.000.

Karas, Gus, to Chevron Research Company. Apparatus and method for gagging a relief valve within a flue secured to a tank. 3,965,916, Cl. 137-15.000.

Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., to M & T Chemicals Inc. Electrodeposition of copper. 3,966,565, Cl. 204-52.00R.

Kariya, Noboru: *See—*
Ariyoshi, Junji; and Kariya, Noboru, 3,966,485.

Karpati, Gyorgy: *See—*
Vass, Karoly; Karpati, Gyorgy; Szechenyi-Marton, Eva; and Simek, Ferenc, 3,966,554.

Karpf, Ferdinand. Automatic regulating equipment for a heating device having a vaporizing burner. 3,966,118, Cl. 237-2.00A.

Kasberg, Alvin H.: *See—*
Foulds, Ronald B.; Kasberg, Alvin H.; Puechl, Karl H.; and Bleiberg, Melvin L., 3,966,550.

Kashio, Hidetora: *See—*
Kidoh, Kunizoh; Kashio, Hidetora; Hosokawa, Toshio; and Kusida, Kazuo, 3,966,696.

Kashiyama, Yoshitaka: *See—*
Yamagishi, Hidehisa; Takano, Hiroshi; and Kashiyama, Yoshitaka, 3,966,570.

Kasyanov, Grigory Ivanovich: *See—*
Andoniev, Sergei Mikhailovich; Zilberman, Leonid Borisovich; Kudinov, Gennady Alexandrovich; Kutsykovich, Dorina Borisovna; Filipiev, Oleg Vladimirovich; Kasyanov, Grigory Ivanovich; Zalmanovich, Grigory Borisovich; and Raikovsky, Jury Borisovich, 3,966,179.

Katagi, Fusao, to Katagi Goseikagaku Kabushiki Kaisha. Untwisted synthetic resin string and apparatus for manufacturing the string. 3,967,038, Cl. 428-397.000.

Katagi Goseikagaku Kabushiki Kaisha: *See—*
Katagi, Fusao, 3,967,038.

Kato, Takashi; Yamanaka, Toru; and Komatsu, Akira, to Takasago Perfumery Co., Ltd. Process for preparing parabenzoquinones. 3,966,776, Cl. 260-396.00R.

Kato, Tetsuji, to Mitsubishi Rayon Co., Ltd. Method of and apparatus for continuously preparing a syrup of a monomer-polymer mixture. 3,966,693, Cl. 526-75.000.

Kato, Toshiro: *See—*
Oishi, Tadashi; Kameda, Nobuyuki; Kato, Toshiro; Fujinami, Akira; Ozaki, Toshiaki; and Itooka, Eiyashi, 3,966,789.

Kato, Yozo: *See—*
Kurata, Tokuzo; Okano, Takeshi; Tamaru, Akio; Kato, Yozo; and Nagashima, Saburo, 3,966,810.

Katoh, Takayuki: *See—*
Omori, Akira; Okamura, Isao; Imoto, Tadasi; and Katoh, Takayuki, 3,966,597.

Katuharu, Doma: *See—*
Tomokazu, Suzuki; and Katuharu, Doma, 3,965,668.

Katz, Ira: *See—*
Wilson, Richard Arnold; Katz, Ira; Vock, Manfred H.; and Shuster, Edward J., 3,966,988.

Katz, Saul N.; and Dwyer, Daniel E., Jr., to General Foods Corporation. Process for freezing coffee extract. 3,966,979, Cl. 426-385.000.

Katz, Sheldon B.; Burton, Frederick J., Jr.; and Cullo, Leonard A., to Harshaw Chemical Company, The. Supported cobalt sulfate desulfurization catalyst. 3,966,640, Cl. 252-440.000.

Kawa, Ryuichi, to Ricoh Co., Ltd. Pattern recognition system. 3,967,241, Cl. 340-146.30H.

Kawa, Ryuichi, to Kabushiki Kaisha Ricoh. Character pattern normalization method and apparatus for optical character recognition system. 3,967,243, Cl. 340-146.30H.

Kawaguchi, Hiroshi: *See—*
Tanizaki, Yoshiharu; Kawaguchi, Hiroshi; and Minagawa, Kenichiro, 3,966,625.

Kawai, Noriaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition timing control apparatus. 3,965,874, Cl. 123-117.00A.

Kawakami, Akira: *See—*
Takase, Yahei; and Kawakami, Akira, 3,967,294.

Kawamata, Kiyoshi, to Nihon Seikan Kabushiki Kaisha. Seal for can or like container. 3,966,079, Cl. 220-266.000.

Kawamata, Kiyoshi, to Nihon Seikan Kabushiki Kaisha. Seal for can or like container. 3,966,081, Cl. 220-270.000.

Kawamata, Masanobu; Ushimaru, Hirokazu; Sano, Akira; and Takahashi, Yutaka, to Nippon Shinyaku Co., Ltd. Method of preparing aqueous solutions of sterol glycosides and their ester derivatives. 3,966,918, Cl. 424-182.000.

Kawasaki Steel Corporation: *See—*
Ito, Shunji; Morioka, Yasuaki; Kajinaga, Yoshihiro; Nitta, Minoru; and Sakurada, Ichio, 3,966,454.

Kawase, Makoto. Method of potting trees and shrubs. 3,965,617, Cl. 47-58.000.

Kawata, Kiyoshi: *See—*
Muramatu, Akira; and Kawata, Kiyoshi, 3,967,245.

Kawazu, Satoru: *See—*
Nomura, Kousi; Kawazu, Satoru; Hirose, Yoshihiko; Inoue, Isao; Watari, Yoshihiko; and Kijima, Koichi, 3,966,501.

Kay, Edward Leo: *See—*
Crane, Grant; and Kay, Edward Leo, 3,966,487.

Kayaku Antibiotic Research Co., Ltd.: *See—*
Ito, Akiro; Ichikawa, Yasushi; Horiguchi, Sadayuki; Shirota, Shyoji; Kayama, Yasuo; Chihara, Shiro; Haneda, Isoko; Hasuda, Katsumi; and Takano, Shyoichi, 3,966,913.

Kayama, Yasuo: *See—*
Ito, Akiro; Ichikawa, Yasushi; Horiguchi, Sadayuki; Shirota, Shyoji; Kayama, Yasuo; Chihara, Shiro; Haneda, Isoko; Hasuda, Katsumi; and Takano, Shyoichi, 3,966,913.

KB-Denver, Inc.: *See—*
Pounds, Walter R., 3,967,084.

Keairns, Dale L.: *See—*
Craig, John W. T.; O'Neill, Eoin P.; and Keairns, Dale L., 3,966,431.

Kee, Richard C.: *See—*
Fischer, Richard V.; and Kee, Richard C., 3,967,303.

Keefe, George E.: *See—*
Almasi, George S.; Hendel, Robert J.; Keefe, George E.; Lin, Yeong S.; and McGouey, Richard P., 3,967,002.

Kefalas A/S: *See—*
Buus, Jorn Lasse Martin; and Lassen, Niels, 3,966,930.
Buus, Jorn Lasse Martin, 3,966,952.

Kegelart, Willy: *See—*
Ninane, Leon; and Kegelart, Willy, 3,967,039.

Keiper KG: *See—*
Berghof, Hans-Joachim; Hacklander, Hans-Gerd; and Klingelhofer, Gerd, 3,966,253.

Keller, Rudolf: *See—*
Oxe, Josef; and Keller, Rudolf, 3,966,659.

Kelley, Eugene W., to Cabot Corporation. Powder metallurgically produced alloy sheet. 3,966,422, Cl. 29-182.700.

Kellogg, Walter J.; and Calvin, Chester W., to Westinghouse Electric Corporation. Indicator lamp test circuit utilizing bidirectional thyristor switching. 3,967,192, Cl. 324-21.000.

Kelly, Robert C., to Upjohn Company, The. Oxazolidines of 4-oxotricyclo[5.1.0^{2,8}]octan-8-endo-carboxaldehyde, neopentyl glycol acetal. 3,966,751, Cl. 260-307.0FA.

Kelly, Robert R., to BJ-Hughes Inc. Shock absorber for tubular storage or drill stands on a drilling ship. 3,966,054, Cl. 211-60.00S.

Kelm, Roger W., to Gould Inc. Electrode assembly for air depolarized cells. 3,966,496, Cl. 136-86.00A.

Kelsey-Hayes Company: *See—*
Atkins, Thomas M., 3,966,266.

Kelso, Gordon W. Dispenser. 3,966,086, Cl. 221-234.000.

Kemanord Aktiebolag: *See—*
Helmer, Karin Ulla Elisabet; and Reuterhall, Alf Ragnar, 3,966,484.

Kempson, Geoffrey Edward: *See—*
Freeman, Michael Alexander Reykers; Kempson, Geoffrey Edward; and Tuke, Michael Anthony, 3,965,489.

Kendall Company, The: *See—*
Boedecker, Steven M., 3,965,900.
Hardy, David R.; and Weatherford, Richard C., 3,965,907.

Kennedy, Carl D.: *See—*
Clark, Charles R.; Gregory, M. Duane; Kerfoot, Oliver C.; Krehbiel, Delmar D.; and Kennedy, Carl D., 3,965,984.

Kennedy, James M. Brake mcans for a center pivot irrigation system. 3,965,924, Cl. 137-344.000.

Kennedy, Timothy James, to Procter & Gamble Company, The. Dry stable instant beverage mix. 3,966,994, Cl. 426-590.000.

Kenney, Warren Eugene: *See—*
James, Edward William, II; and Kenney, Warren Eugene, 3,965,548.

Kerfoot, Oliver C.: *See—*
Clark, Charles R.; Gregory, M. Duane; Kerfoot, Oliver C.; Krehbiel, Delmar D.; and Kennedy, Carl D., 3,965,984.

Kern, Robert H., to Frequency & Time Systems, Inc. Atomic beam tube. 3,967,115, Cl. 250-251.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Brixy, Heinz, 3,966,500.

Kessler, Hans-Joachim: *See—*
Rufer, Clemens; Schroder, Eberhard; and Kessler, Hans-Joachim, 3,966,732.

Keystone Consolidated Industries, Inc.: *See—*
Roser, Kenneth L., 3,965,793.

Khaidurov, Efim Leontievich; and Razorenov, Vladimir Alexandrovich. Firing and trigger mechanism for self-loading match pistol. 3,965,604, Cl. 42-69.00B.

Khattab, Ghazi; and Witonsky, Robert J., to Bio-Medical Sciences, Inc. Time temperature indicators. 3,966,414, Cl. 23-253.0TP.

Khmelnitsky, Lenor Ivanovich: *See—*
Novikov, Sergei Sergeevich; Khmelnitsky, Lenor Ivanovich; Lebedev, Oleg Vasilievich; Epishina, Lia Vladimirovna; Suvorova, Ljudmila Ivanovna; Lapshina, Lidia Vasilievna; Krylov, Valery Dmitrievich; Zaikonnikova, Irina Vitalievna; Zimakova, Irina Evgenievna; Chudnovsky, Vladimir Sergeevich; Babichev, Viktor Andreevich; and Avdonina, Nina Alexandrovna, 3,966,742.

Kibbel, William H., Jr.: *See—*
O'Neill, Eugene T.; and Kibbel, William H., Jr., 3,966,450.

Kidoh, Kunizoh; Kashio, Hidetora; Hosokawa, Toshio; and Kusida, Kazuo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing vinylchloride resin having a highly porous uniform granular structure. 3,966,696, Cl. 526-199.000.

Kieldsen, William E.; and Mieras, Raymond J. Fruit pitting apparatus. 3,965,809, Cl. 99-492.000.

Kienholz, Karl E. Apparatus for sprouting seeds. 3,965,614, Cl. 47-14.000.

Kierstead, Richard Wightman: *See—*
Guthrie, Robert William; Hamilton, James Guthrie; Kierstead, Richard Wightman; Miller, O. Neal; and Sullivan, Ann Clare, 3,966,772.

Kijima, Koichi: *See—*
Nomura, Kousi; Kawazu, Satoru; Hirose, Yoshihiko; Inoue, Isao; Watari, Yoshihiko; and Kijima, Koichi, 3,966,501.

Kikust, Daniel Petrovich: *See—*
Apsit, Voldemar Voldemarovich; Sika, Zigurd Karlovich; and Kikust, Daniel Petrovich, 3,967,145.

Kilbourn, Edward E.; and Weiler, Ernest D., to Rohm and Haas Company. Pyridyl phenyl-carbamate rodenticide. 3,966,947, Cl. 424-263.000.

Killian, Gerald I. Triggerless archery bow string release. 3,965,884, Cl. 124-35.00A.

Kimber, Geoffrey Michael: *See—*
Gray, Michael David; and Kimber, Geoffrey Michael, 3,966,584.
Gray, Michael David; Kimber, Geoffrey Michael; and Shipley, David Ernest, 3,966,585.

Kimberly-Clark Corporation: *See—*
Mitchell, Kenneth J.; and Ostermeier, Kurt W., 3,966,519.
Werner, Edward E., 3,966,126.

Kimura, Kaoru: *See—*
Saito, Jiro; Kimura, Kaoru; Kusuhara, Hiroshi; and Nakaguma, Kazuyoshi, 3,965,686.

Kimura, Kazumi: *See—*
Osako, Naoto; Kozima, Katsumi; Shimizu, Hiroshi; and Kimura, Kazumi, 3,966,853.

Kimura, Kazuo; and Yamazaki, Yasuo, to Minolta Camera Kabushiki Kaisha. Light receiving device for use in a single lens reflex camera. 3,967,287, Cl. 354-56.000.

Kimura, Takeo: *See—*
Namiki, Hiroshi; Minemura, Norihiro; Kimura, Takeo; and Takahashi, Shigeru, 3,966,406.

King, James Ping; Simkin, Joseph; and Radice, Peter F., to Pennwalt Corporation. High temperature pigmented coatings based on zirconium phosphinate polymer binders crosslinked with phosphinic acids. 3,966,486, Cl. 106-287.00R.

King, John O., Jr. Split pintail fastener assembly. 3,965,792, Cl. 85-7.000.

King, William E., Jr., to United States of America, Navy. Load crack testing device. 3,965,729, Cl. 73-90.000.

Kinghan, Derek Alfred: *See—*
Watkins, Robert Charles; Kinghan, Derek Alfred; and Humphrey, Robert Walter, 3,966,621.

Kirk, Norman. Stretching exercising device. 3,966,200, Cl. 272-109.000.

Kirk, William P.; and Reynolds, Dwight W. Apparatus for spilling retrieval. 3,966,613, Cl. 210-242.000.

Kirkham, Arthur J. Tent structure. 3,965,915, Cl. 135-1.00R.

Kiscaden, Roy: *See—*
Hobbs, Milton M.; and Kiscaden, Roy, 3,965,674.

Kissler & Co., Inc.: *See—*
Kissler, Gerald, 3,965,528.

Kissler, Gerald, to Kissler & Co., Inc. Universal elbow action lever handle. 3,965,528, Cl. 16-110.00R.

Kitano, Masahiko: *See—*
Murai, Hiromu; Ohata, Katsuya; Aoyagi, Yoshiaki; Ueda, Fusao; Kitano, Masahiko; Takata, Satoshi; and Tada, Shinichi, 3,966,728.

Kjellqvist, Erik, to Almqvist & Wiksell Forlag AB. Mounting device or book for storing, displaying and handling transparent pictures. 3,965,595, Cl. 40-104.180.

Kjoller, Hans Ole; and Sjoquist, Erik Ivar, to Telefonaktiebolaget L M Ericsson. Arrangement for double-writing into a memory during data field relocation. 3,967,248, Cl. 340-172.500.

Klatt, Kenneth G.; Walling, Ronald L.; and Hallstrom, James R., to Rexnord Inc. Ambient temperature compensated resin-hardener fillers. 3,966,657, Cl. 260-29.2EP.

Klaue, Hermann. Brake system for vehicles. 3,966,008, Cl. 180-75.000.

Klein, Albert: *See—*
Plotz, Kurt; Breschar, Klaus; and Klein, Albert, 3,967,032.

Klein, Donald J.: *See—*
Becker, Kenneth W.; Baczewski, Klemens C.; and Klein, Donald J., 3,966,982.

Klein, Gerhart P.; and Kallianidis, Milton, to P. R. Mallory & Co., Inc. Riser protection for anodes. 3,967,000, Cl. 427-58.000.

Kleiner, Frank Gerald; and Muller, Karl Heinz, to Bayer Aktiengesellschaft. Process for the production of fine-cell polyolefin foams. 3,966,651, Cl. 260-2.5HA.

Kleisser, Werner; and Motting, Gotz, to Daimler-Benz Aktiengesellschaft. Installation for securing of pivotal hoods or flaps, especially engine hoods. 3,966,244, Cl. 292-127.000.

Kleykamp, Donald L.: *See—*
Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., 3,966,104.

Kline, Gaylen O., to National Machinery Company, The. Transfer mechanism. 3,965,718, Cl. 72-405.000.

Klingaman, Richard James, to Colgate-Palmolive Company. Diluting and dispensing container. 3,966,089, Cl. 222-88.000.

Klingelhofer, Gerd: *See—*
Berghof, Hans-Joachim; Hacklander, Hans-Gerd; and Klingelhofer, Gerd, 3,966,253.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Schneider, Heinrich; and Boser, Ernst, 3,966,395.

Klockner-Werke AG: *See—*
Gutjahr, Lothar, 3,965,744.

Klose, Peter H.: *See—*
Wacks, Harvey H.; Klose, Peter H.; Ovshinsky, Stanford R.; and Hallman. Robert W., 3,966,317.

Klove, Edwin H., Jr.: *See—*
Campbell, David D.; and Klove, Edwin H., Jr., 3,966,224.

Knapp, Julius Z.; and Zeiss, John C., to Schering Corporation. Method and apparatus for inspecting liquids in transparent containers. 3,966,332, Cl. 356-197.000.

Knaus, Reto. Arrangement for keeping tools of the drilling, milling, boring type etc. in readiness for use on machine tools. 3,966,052, Cl. 211-60.00T.

Knight, Geoffrey Thomas: *See—*
Cutts, Ernest; and Knight, Geoffrey Thomas, 3,966,530.

Knochenhauer, Horst: *See—*
Brunner, Manfred; and Knochenhauer, Horst, 3,965,806.

Knoop, Donald E.; and Seeland, Rodney F., to Whirlpool Corporation. Method and apparatus for testing electric motors. 3,967,199, Cl. 324-158.0MG.

Knowlton, Kenneth Charles, to Bell Telephone Laboratories, Incorporated. Method and apparatus for using pushbutton telephone keys for generation of alpha-numeric information. 3,967,273, Cl. 340-365.00S.

Kobayashi, Akihiro: *See—*
Sasaya, Hideaki; and Kobayashi, Akihiro, 3,967,079.

Kobayashi, Kenji; Fukumaru, Toshitsugu; Mizote, Hiroyuki; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Novel 2-substituted 6,7-benzomorphan derivatives and salts thereof in analgesic compositions. 3,966,939, Cl. 424-260.000.

Kobe Steel Ltd.: *See—*
Godai, Tomokazu; Sugiyama, Toboru; and Nishimura, Katushi, 3,966,424.

Koblitz, Francis Frederick, to Dentsply Research & Development Corporation. Dental investment material. 3,966,479, Cl. 106-38.50R.

Koch, Robert E.; and Ceder, James H., to General Electric Company. Electric current limiting fuse having a filter disposed in one end cap. 3,967,228, Cl. 337-248.000.

Kodera, Yoshinobu, to Bear Co. Ltd. Strap for wrist watch. 3,965,671, Cl. 59-80.000.

Koehring GmbH — Bomag Division: *See—*
Kofel, Ferdinand, 3,966,345.

Kofel, Ferdinand, to Koehring GmbH — Bomag Division. Tandem road roller. 3,966,345, Cl. 404-126.000.

Koga, Isao: *See—*
Fukui, Masahiro; Hayashi, Shigeru; Okamoto, Takehiko; Koga, Isao; and Inoi, Takeshi, 3,966,822.

Kogler, Georg; Kuhnlein, Hans; and Liska, Manfred, to Siemens Aktiengesellschaft. Electronic commutation apparatus for a brushless D.C. motor. 3,967,174, Cl. 318-254.000.

Kohl, Gerald C. Forming a removable closure member in situ. 3,966,869, Cl. 264-242.000.

Kohler, Constance Anne: *See—*
Ellenbogen, Leon; and Kohler, Constance Anne, 3,966,960.
Ellenbogen, Leon; and Kohler, Constance Anne, 3,966,978.

Koike, Hiroshi: *See—*
Fukui, Akio; Koike, Hiroshi; Tanaka, Takehiko; and Ito, Yuji, 3,966,775.

Koivunen, Erkki A., to General Motors Corporation. Hydrodynamic drive and slipping clutch. 3,966,032, Cl. 192-3.300.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Senda, Yasuhiro; and Ando, Sumitoshi, 3,967,250.

Kolling, Heinrich: *See—*
Kurz, Jurgen; Kolling, Heinrich; and Federmann, Manfred, 3,966,964.
Reisdorff, Josef Helmut; Aichinger, Gerd; Haberkorn, Axel; Kolling, Heinrich; and Kranz, Eckart, 3,966,725.

Komada, Kenya; and Kondo, Yoshiaki, to Ricoh Co., Ltd. Sheet conveying device. 3,966,198, Cl. 271-265.000.

Komai, Mithumasa: *See—*
Mukushi, Toshimi; Izumi, Kenkichi; Takahashi, Sankichi; Okazima, Yoshiaki; Sawa, Toshio; and Komai, Mithumasa, 3,966,562.

Komatsu, Akira: *See—*
Kato, Takashi; Yamanaka, Toru; and Komatsu, Akira, 3,966,776.

Kondo, Sadao: *See—*
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Kondo, Yoshiaki: *See—*
Komada, Kenya; and Kondo, Yoshiaki, 3,966,198.

Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, to Bayer Aktiengesellschaft. Penicillins and cephalosporins and their production. 3,966,709, Cl. 260-239.100.

Koniger, Rudolf: *See—*
Frischmann, Albert; Mermi, Kurt; Hermeneit, Rainer; and Koniger, Rudolf, 3,966,156.

Konomi, Tsohiaki; Nurita, Joji; and Tanazawa, Yasushi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Flow equalizing means. 3,965,873, Cl. 123-52.00M.

Kopecky, Ivyl: *See—*
Anderson, Joseph A.; Neukom, Chester G.; and Kopecky, Ivyl, 3,966,128.

Kopp, George A., Sr.: *See—*
Hotchkiss, Kenneth W.; and Kopp, George A., Sr., 3,966,074.

Koppensteiner, Gunther: *See—*
Andree, Hans; Koppensteiner, Gunther; and Stracke, Heinz-Ulrich, 3,966,968.

Koppers Company, Inc.: *See—*
Williams, Charles H., 3,966,856.

Kori, Seiji: *See—*
Hayashi, Masaki; Kori, Seiji; Ohyama, Isao; and Endo, Hirofumi, 3,966,792.

Korn, Siegfried; Kratzer, Bernd; and Muckenhaupt, Otto, to Carl Zeiss-Stiftung. Method of producing photochromic multifocal spectacle lenses. 3,966,311, Cl. 351-164.000.

Kosaka, Yujiro: *See—*
Uemura, Masaru; Kuroki, Hitoshi; Echida, Nobuhiro; Kosaka, Yujiro; and Otomo, Kanji, 3,967,020.

Kosik, Samuel J., Jr. Apparatus for loading and unloading presses. 3,966,380, Cl. 425-338.000.

Kosonocky, Walter Frank; and Sauer, Donald Jon, to RCA Corporation. Charge transfer memory. 3,967,254, Cl. 340-173.00R.

Kovacs, Jenoe; Jung, Hans; Marx, Matthias; Spoor, Herbert; and Roschke, Wilfried, to BASF Aktiengesellschaft. Manufacture of polyester imide dispersions. 3,966,655, Cl. 260-29.20N.

Kovar, Robert F.; and Arnold, Fred E., to United States of America, Air Force. Addition curable phenyl-quinoxaline compositions and their synthesis. 3,966,729, Cl. 260-250.00Q.

Koyama, Takeshi: *See—*
Nakano, Mineo; Koyama, Takeshi; Matsumoto, Yoshiro; and Maruoka, Akira, 3,966,390.

Kozai, Tetsuo; and Shiraki, Shomitsu, to Morita Pump Kabushiki Kaisha. Working platform lifting apparatus for aerial ladder truck. 3,966,018, Cl. 182-103.000.

Kozima, Katsumi: *See—*
Osako, Naoto; Kozima, Katsumi; Shimizu, Hiroshi; and Kimura, Kazumi, 3,966,853.

Kozulla, Robert E., to Weatherhead Company, The. Hose skiving tool. 3,965,570, Cl. 30-90.100.

Kraftwerk Union Aktiengesellschaft: *See—*
Schroder, Peter, 3,966,871.

Krambeck, Robert Harold, to Bell Telephone Laboratories, Incorporated. Input circuit for semiconductor charge transfer device circulating memory apparatus. 3,967,136, Cl. 307-221.00D.

Krampl, Victor: *See—*
Hunter, George L. K.; Krampl, Victor; Malone, Charles Thomas; and Usher, Gerald Edward, 3,966,986.

Kranz, Eckart: *See—*
Reisdorff, Josef Helmut; Aichinger, Gerd; Haberkorn, Axel; Kolling, Heinrich; and Kranz, Eckart, 3,966,725.

Krapukhin, Viktor Mikhailovich: *See—*
Alexandrov, Nikolai Nikitievich; Zorev, Nikolai Nikolaevich; Krapukhin, Viktor Mikhailovich; Krotov, Viktor Vasilievich; Kryanin, Ivan Romanovich; Milman, Boris Samoilovich; Semenov, Pavel Vladimirovich; Sokolov, Nikolai Anatolievich; and Tinyakov, Viktor Gurievich, 3,965,968.

Kratzer, Bernd: *See—*
Korn, Siegfried; Kratzer, Bernd; and Muckenhaupt, Otto, 3,966,311.

Krauss-Maffei Aktiengesellschaft: *See—*
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Krehbiel, Delmar D.: *See—*
Clark, Charles R.; Gregory, M. Duane; Kerfoot, Oliver C.; Krehbiel, Delmar D.; and Kennedy, Carl D., 3,965,984.

Krenzer, John, to Velsicol Chemical Corporation. Dialkyl acetals of anilinoacetaldehydes. 3,966,811, Cl. 260-562.00B.

Kresge, James S.; and Fiegel, Harvey E., to General Electric Company. Electrical overvoltage surge arrester with a long time constant valve section and series gap section. 3,967,160, Cl. 317-68.000.

Kress, Robert W.: *See—*
Corbett, Marshall J.; and Kress, Robert W., 3,966,142.

Kressley, Leonard J.: *See—*
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Kreuder, Hans Joachim: *See—*
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Kriesten, Wolfgang: *See—*
Feldmann, Rainer; Kriesten, Wolfgang; Muller, Karl Adolf; Panoch, Hans Joachim; and Scholten, Heinz, 3,966,838.

Krimm, Heinrich; Schnell, Hermann; and Schwarz, Hans-Helmut, to Bayer Aktiengesellschaft. Process for the preparation of bisphenol bischlorocarbonic acid esters. 3,966,785, Cl. 260-463.000.

Kristiansen, Odd: *See—*
Beriger, Ernst; Kristiansen, Odd; Rufenacht, Kurt; and Bader, Jorg, deceased, 3,966,921.

Kristinsson, Haukur: *See—*
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Kroger, Donald J.: *See—*
Kroger, Douglas J.; Kroger, Donald J.; Jensen, Winton D.; and Rohrs, Donald L., 3,966,076.

Kroger, Douglas J.; Kroger, Donald J.; Jensen, Winton D.; and Rohrs, Donald L., to Consolcase, Inc. Contact lens accessory case. 3,966,076, Cl. 220-20.000.

Krotov, Viktor Vasilievich: *See—*
Alexandrov, Nikolai Nikitievich; Zorev, Nikolai Nikolaevich; Krapukhin, Viktor Mikhailovich; Krotov, Viktor Vasilievich; Kryanin, Ivan Romanovich; Milman, Boris Samoilovich; Semenov, Pavel Vladimirovich; Sokolov, Nikolai Anatolievich; and Tinyakov, Viktor Gurievich, 3,965,968.

Krug, Robert H.; and Henry, Clemence J., to Texaco Inc. Corrosion inhibited lube oil compositions. 3,966,623, Cl. 252-47.000.

Kryanin, Ivan Romanovich: *See—*
Alexandrov, Nikolai Nikitievich; Zorev, Nikolai Nikolaevich; Krapukhin, Viktor Mikhailovich; Krotov, Viktor Vasilievich; Kryanin, Ivan Romanovich; Milman, Boris Samoilovich; Semenov, Pavel Vladimirovich; Sokolov, Nikolai Anatolievich; and Tinyakov, Viktor Gurievich, 3,965,968.

Krylov, Valery Dmitrievich: *See—*
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Kubinak, Ronald A.: *See—*
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Kubotera, Kikuo; and Mizuki, Eiichi, to Fuji Photo Film Co., Ltd. Process for producing printing plates. 3,966,472, Cl. 96-33.000.

Kudinov, Gennady Alexandrovich: *See—*
Andoniev, Sergei Mikhailovich; Zilberman, Leonid Borisovich; Kudinov, Gennady Alexandrovich; Kutsykovich, Dorina Borisovna; Filipiev, Oleg Vladimirovich; Kasyanov, Grigory Ivanovich; Zalmanovich, Grigory Borisovich; and Raikovsky, Jury Borisovich, 3,966,179.

Kudo, Ken-Ichi; Ohmae, Tadayuki; Toyoshima, Yoshiki; and Hara, Sumio, to Sumitomo Chemical Company, Limited. Process for preparing 1-tetrahydronaphthalone. 3,966,821, Cl. 260-590.00R.

Kuether, Roger F.: *See—*
Larson, Gerald L.; and Kuether, Roger F., 3,965,669.

Kuhnlein, Hans: *See—*
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Kukers, William: *See—*
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Kulczycki, Karol; Darsie, Burns; and Dow, Norris F. Heddle with guide means thereon for use in a weaving machine for making triaxial fabrics. 3,965,939, Cl. 139-48.000.

Kumano, Masayoshi: *See—*
Mitsuoka, Hiroshi; and Kumano, Masayoshi, 3,967,138.

Kump, Ernest Joseph. Joint assembly and fastener therefor. 3,965,958, Cl. 52-753.00K.

Kundikoff, Peter. Poultry carrier incorporating disposable feed trays. 3,965,865, Cl. 119-19.000.

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Maekawa, Minoru, 3,967,010.

Kurata, Tokuzo; Okano, Takeshi; Tamaru, Akio; Kato, Yozo; and Nagashima, Saburo. Process for hydrating a nitrile to the corresponding amide. 3,966,810, Cl. 260-561.00N.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
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Kidoh, Kunizoh; Kashio, Hidetora; Hosokawa, Toshio; and Kusida, Kazuo, 3,966,696.
Takahashi, Masaaki; Ito, Akira; and Igarashi, Yuriko, 3,966,674.

Kurita, Takaji; and Fujiwara, Takao, to Minolta Camera Kabushiki Kaisha. Residual toner removing apparatus. 3,965,524, Cl. 15-308.000.

Kurobe, Moriji; Araga, Toshimi; Ito, Nobuhiro; Sato, Shigeyuki; and Takahashi, Hidero, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Pre-coated metal sheet. 3,967,045, Cl. 428-463.000.

Kuroda, Makoto; Morimoto, Kazuhisa; and Minobe, Akira, to Matsushita Electric Industrial Co., Ltd. Electrophotographic photosensitive composition employing a prepolymer of diallylphthalate. 3,966,469, Cl. 96-1.500.

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Kurokawa, Koji: *See—*
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Kuromitsu, Hiromu; and Ohara, Naoki, to Aisin Seiki Kabushiki Kaisha. Reservoir. 3,966,605, Cl. 210-130.000.

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Kusida, Kazuo: *See—*
Kidoh, Kunizoh; Kashio, Hidetora; Hosokawa, Toshio; and Kusida, Kazuo, 3,966,696.

Kusters, Eduard: *See—*
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Kusuhara, Hiroshi: *See—*
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Kutsykovich, Dorina Borisovna: *See—*
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Kuwabara, Motosuke: *See—*
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Kyburz, Emilio: *See—*
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Kyker, Glendon D.: *See—*
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La Detection Electronique Francaise Protecbat: *See—*
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LaBash, John David; and McGinniss, Vincent D., to SCM Corporation. Ultraviolet polymerization coatings suitable for food packaging using FDA approved dyes as photosensitizers. 3,966,574, Cl. 204-159.240.

LaBoda, John Albert, to Advance Manufacturing Corporation. Method and machine for making twisted wire beads for tires. 3,966,131, Cl. 242-4.0BE.

Labofina S.A.: *See—*
Andre, Jacques Maurice Jules; van Thillo, Hugo Johannes; Lammers, Rene Odon; Debus, Henri Robert; and Cahen, Raymond Marc, 3,966,996.

Lackey, Robert P.: *See—*
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Lademann, Rudolf; Lindner, Helmut; Martini, Thomas; and Rammelt, Peter Paul, to Hoechst Aktiengesellschaft. Continuous process for preparing derivatives of benzene with fluorinated side chains from the corresponding chlorine compounds. 3,966,832, Cl. 260-651.00F.

Lafage, Yves: *See—*
Herment, Robert; Lafage, Yves; Emo, Jean Claude; and Yurcek, Jean Marie, 3,966,427.

Lagoutte, Serge; and Lanciaux, Andre, to Societe d'Etudes Verrieres. Feed device for plastics processing machines. 3,966,177, Cl. 259-185.000.

Lamb, C. Paul, to Teledyne, Inc. Orienting system for a kickover tool. 3,965,979, Cl. 166-117.500.

Lambert, Richard J., to Minnesota Mining and Manufacturing Company. Printable pressure-sensitive adhesive tape. 3,967,031, Cl. 428-294.000.

Lambert, Yvon: *See—*
Monkovic, Ivo; Saucier, Michel; Lambert, Yvon; and Montzka, Thomas Alfred, 3,966,747.

Lamberti, Vincent; and Gutierrez, Eddie N., to Lever Brothers Company. Perfume compositions containing monoalkyl-para-dioxanes. 3,966,647, Cl. 252-522.000.

Lamel, Jerome E.: *See—*
Yang, Frank; and Lamel, Jerome E., 3,965,862.

Lammers, Jan Frederik: *See—*
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Lammers, Rene Odon: *See—*
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Lanciaux, Andre: *See—*
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Lang, John M., to Xerox Corporation. Flat field scanning mirror. 3,966,319, Cl. 355-66.000.

Langdon Corporation, The: *See—*
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Langenfelder, Hans; Daubach, Ewald; and Belde, Horst, to BASF Aktiengesellschaft. Flowable aqueous pigment formulations containing dipropylene glycol. 3,966,488, Cl. 106-308.00Q.

Lanier, Richard J.: *See—*
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Lantor of Australia Pty. Ltd.: *See—*
Fair, Graeme David; Hasmall, Derek Lesley Arthur; Ryan, William Patrick; and Sellman, Edwin John, 3,966,912.

Lapshina, Lidia Vasilievna: *See—*
Novikov, Sergei Sergeevich; Khmelnitsky, Lenor Ivanovich; Lebedev, Oleg Vasilievich; Epishina, Lia Vladimirovna; Suvorova, Ljudmila Ivanovna; Lapshina, Lidia Vasilievna; Krylov, Valery Dmitrievich; Zaikonnikova, Irina Vitalievna; Zimakova, Irina Evgenievna; Chudnovsky, Vladimir Sergeevich; Babichev, Viktor Andreevich; and Avdonina, Nina Alexandrovna, 3,966,742.

Larsen, Donald W., to W. R. Grace & Co. Curable polyene-polythiol compounds. 3,966,794, Cl. 260-471.00C.

Larson, Charles O., to Charles O. Larson Co. Article support device. 3,966,056, Cl. 211-134.000.

Larson, Doublas A.: *See—*
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Larson, Gerald L.; and Kuether, Roger F., to Eaton Corporation. Engine running time indicator. 3,965,669, Cl. 58-146.000.

Larson, Merlin D. Pupillometer and method of use thereof. 3,966,310, Cl. 351-16.000.

Larson, Paul E.: *See—*
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Larsson, John, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Process and an apparatus for purifying a stream of mechanically comminuted material as well as for enriching fine ores and other minerals by mechanical sorting. 3,966,593, Cl. 209-479.000.

Laskin, Harold B.; and Valentine, Robert H., to Minnesota Mining and Manufacturing Company. Fuser blanket. 3,967,042, Cl. 428-422.000.

Lassen, Niels: *See—*
Buus, Jorn Lasse Martin; and Lassen, Niels, 3,966,930.

Laurent, Henry: *See—*
Hofmeister, Helmut; Laurent, Henry; Wiechert, Rudolf; Annen, Klaus; and Steinbeck, Hermann, 3,966,713.

Lavigne, Jean; Chesnel, Pierre; and Bouguyon, Gerard, to Schlumberger Technology Corporation. Well bore perforating apparatus. 3,965,993, Cl. 175-4.600.

Lawrence Peska Associates, Inc.: *See—*
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Lawson, Jerry Joe: *See—*
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Leavens, Kenneth David: *See—*
Andrews, John Frederick Collett; Beton, Roy Victor; Leavens, Kenneth David; and Scott, Gordon John, 3,966,060.

Lebedev, Oleg Vasilievich: *See—*
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Lectra Bike Corporation: *See—*
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Lectrofood, Inc.: *See—*
Theimer, Ernst Theodore; and Heinze, George E., 3,966,972.

Lecuyer, Daniel Marie Pierre, to La Detection Electronique Francaise Protecbat. Security system with plural sensors connected in parallel across the transmission line. 3,967,259, Cl. 340-258.00D.

Lee, David Q.: *See—*
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Lee, Donald R. Animal trap. 3,965,607, Cl. 43-87.000.

Lee, George D.: *See—*
Hatch, Donald M.; and Lee, George D., 3,966,013.
Hatch, Donald M.; and Lee, George D., 3,966,522.

Lee, Hong Man, to Champion International Corporation. Method for producing distressed wood. 3,967,007, Cl. 427-223.000.

Lee, Kwan-Hua, to University of California, The Regents of the. Compositions and methods of treating psoriasis with vinyligs of desmethyl retinoic acid. 3,966,967, Cl. 424-318.000.

Lee-Norse, Company: *See—*
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Lee, Share-Young: *See—*
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Lees, Byrom, to British Petroleum Company Limited, The. Boiler. 3,965,829, Cl. 110-22.00R.

Legavre, Marcel: *See—*
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Leger, Andre: *See—*
Jeanmart, Claude; Leger, Andre; and Messer, Mayer Naoum, 3,966,931.

Lehmacher, Hans. Method and apparatus for manufacture of pad-stacked bags. 3,966,524, Cl. 156-182.000.

Lehmenn, Gunter: *See—*
Diem, Hans; Dudeck, Christian; and Lehmenn, Gunter, 3,966,727.

Lehn, Jean-Marie, to Schering Corporation. Monocyclic macrocyclic compounds and complexes thereof. 3,966,766, Cl. 260-327.00R.

Lehnert, Gunther: *See—*
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Leimgruber, Willy; and Weigele, Manfred, to Hoffmann-La Roche Inc. Preparation of dialkyl amino acrylonitrile. 3,966,791, Cl. 260-465.50R.

Lein, Werner: *See—*
Riedl, Rudi; Jungnickel, Regina; Nitsch, Rainer; Lein, Werner; Vetter, Lothar; Schone, Helmut; Weisbach, Gunter; Johne, Hans; Schott, Alfred; Forster, Karl-Heinz; and Johne, Albrecht, 3,966,197.

Leloux, Arnoldus Willem Jan, to Wavin B.V. Manufacturing corrugated perforated plastic tube. 3,965,782, Cl. 83-15.000.

Lenz, George L. Trolling brake. 3,965,839, Cl. 114-145.00A.

Leon, Nicholas Hay; and Swift, John Alan, to Lever Brothers Company. Dyeing keratinous fibers. 3,966,397, Cl. 8-10.000.

Leonard, Charles Arthur: *See—*
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Leopold, Howard S.: *See—*
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Le Page, Jean-Francois: *See—*
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Lerner, Bernard. Packaging apparatus. 3,965,653, Cl. 53-187.000.

Lerner, Irwin S., to A. H. Robins Company, Incorporated. IUD prepackaged in a tubular inserter. 3,965,891, Cl. 128-130.000.

Les Produits Associes, SA: *See—*
Woog, Philippe-Guy, 3,966,359.

Lescarboura, Jaime A.: *See—*
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Lescarden Ltd.: *See—*
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Leskin, Morton B.: *See—*
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Lessard, Normand, to Bombardier Limited. Suspension spring adjuster. 3,966,181, Cl. 267-58.000.

Lesser, George Albert: *See—*
Anderson, Harold Peter; Lesser, George Albert; Lukas, Fredric; Maxon, Rodney Robert; and Viamour, James Hall, 3,967,073.

Lester, J. Harvey, Jr.; and Stewart, James S., to Monsanto Company. Electrolytic hydrodimerization process improvement. 3,966,566, Cl. 204-73.00R.

Le Sueur, Alice E. J., to Raymond Lee Organization, The, a part interest. Napkin ring. 3,965,591, Cl. 40-21.00R.

Les Veaux, John C.: *See—*
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Letchworth, Peter E.: *See—*
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Baker, Don R.; Walker, Francis H.; and Letchworth, Peter E., 3,966,809.

Leute, Richard K.: *See—*
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Goldstein, Avram; Leute, Richard K.; and Ullman, Edwin F., 3,966,764.

Leutner, Volkmar: *See—*
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Lever Brothers Company: *See—*
Curry, Kenneth Vasey; Gamadia, Rustom Kooverji; and Pike, Barry Graham, 3,966,087.
Lamberti, Vincent; and Gutierrez, Eddie N., 3,966,647.
Leon, Nicholas Hay; and Swift, John Alan, 3,966,397.

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Levine, Leonard, to Xerox Corporation. User variable computer memory module. 3,967,251, Cl. 340-172.500.

Levinson, Arthur A.; and Basa, Kenneth B., to National Can Corporation. Vegetable protein product and process. 3,966,977, Cl. 426-331.000.

Levy, Moshe; Vofsi, David; Daren, Stephen; and Cohen, Ella, to Yeda Research & Development Co. Ltd. Production of bromostyrenes. 3,966,831, Cl. 260-650.00R.

Levy, Stephen David; Poeschel, Gordon Paul; and Schrider, Michael Stanley, to American Cyanamid Company. O,O,O',O'-Tetraalkyl, O,O'-vinylenedi-p-phenylene phosphorothioates and compositions containing the same for the control of siphonaptera infestations. 3,966,919, Cl. 424-206.000.

Levy, Stephen David: *See—*
Schrider, Michael Stanley; and Levy, Stephen David, 3,966,848.

Lewalter, Jurgen: *See—*
Merten, Rudolf; Lewalter, Jurgen; and Zecher, Wilfried, 3,966,683.

Lewis, Eugene W.: *See—*
Warden, Fuller; and Lewis, Eugene W., 3,965,578.

Lewis, George E., to Hydril Company. Underwater sealing of exposed ports in relatively closable members. 3,966,235, Cl. 285-25.000.

Lewis, John A., Jr.: *See—*
Cote, Gerald J.; Lewis, John A., Jr.; and Skurski, James K., 3,967,302.

Lewis, John G., to Emerson Electric Co. Lubricated self-aligning bearing assembly. 3,966,278, Cl. 308-72.000.

Lewis, Theras Gordon: *See—*
Dimmick, James Owen; Lewis, Theras Gordon; O'Neill, John Francis; and Fabiano, Lucian Philip, Jr., 3,967,072.

Lexel Corporation: *See—*
Mohler, Galen E., 3,966,309.
Mohler, Galen E., 3,966,325.

Liang, Shou C.: *See—*
Crossley, Cecil L.; Hirsch, Horst E.; and Liang, Shou C., 3,966,568.

Licari, Vincent, to Mack Trucks, Inc. Bottom dump vehicle. 3,966,255, Cl. 298-35.00M.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Beerwerth, Wolfgang; Geppert, Albrecht; Gesing, Horst; and Schimmer, Rigobert, 3,965,567.
Fell, Wolfgang, 3,967,320.

Lichtblau, George Jay. A multi-frequency resonant tag circuit for use with an electronic security system having improved noise discrimination. 3,967,161, Cl. 317-101.00R.

Liddell, Harold G.: *See—*
Dunn, James L., Jr.; and Liddell, Harold G., 3,967,011.

Liebscher, Anton: *See—*
Auberry, Horace Ray; and Liebscher, Anton, 3,965,517.

Lien, Erling L.; Miram, George V.; and Nelson, Richard B., to Varian Asociates. Grid controlled electron source and method of making same. 3,967,150, Cl. 313-338.000.

Lightbody, Charles S. Pneumatic knee pad. 3,965,486, Cl. 2-24.000.

Liller, Paul Richard, to RCA Corporation. Low-voltage aging of cathode-ray tubes. 3,966,287, Cl. 316-1.000.

Limpach, Raymond; and Lorang, Lucien, to ARBED Acieries Reunies de Burbach-Eich-Dudelange S.A. Method of operating a blast furnace using coal auxiliary combustible. 3,966,457, Cl. 75-42.000.

Lin, Yeong S.: *See—*
Almasi, George S.; Hendel, Robert J.; Keefe, George E.; Lin, Yeong S.; and McGouey, Richard P., 3,967,002.

Lincoln, Paul A.: *See—*
Gyongyosi, Laszlo; and Lincoln, Paul A., 3,965,998.

Lindahl, Hilmer C.: *See—*
Friend, Aaron D.; and Lindahl, Hilmer C., 3,967,171.

Linder, Francis X.: *See—*
Clark, Robert V.; Linder, Francis X.; McCreary, Terrance J.; and Taylor, William R., 3,967,283.

Lindner, Helmut: *See—*
Lademann, Rudolf; Lindner, Helmut; Martini, Thomas; and Rammelt, Peter Paul, 3,966,832.

Lindqvist, Jonas Herman, to Hiab-Foco Aktiebolag. Rotator. 3,966,249, Cl. 294-88.000.

Linhardt, Hans D., to Airco, Inc. Process air compression system. 3,966,362, Cl. 417-374.000.

Lion Yushi Kabushiki Kaisha (Lion Fat & Oil Co., Ltd.): *See—*
Yamaguchi, Tadashi; Ono, Takayuki; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, 3,967,006.

Lipman, Jean M.: *See—*
Nemecek, Borivoj; and Lipman, Jean M., 3,966,339.

Liska, Manfred: *See—*
Kogler, Georg; Kuhnlein, Hans; and Liska, Manfred, 3,967,174.

Little, David Murray; and Zimmerman, Gary Lee, to AMP Incorporated. Polarized connector. 3,966,290, Cl. 339-17.0LC.

Littman, Bruce A., to Benson Mfg. Corporation. Downspout extension. 3,966,121, Cl. 239-197.000.

Litton Systems, Inc.: *See—*
Levie, Stephen A., 3,967,156.

Livigni, Russell Anthony: *See—*
Hargis, Ivan Glen; and Livigni, Russell Anthony, 3,966,638.

Lockard, Joseph Larue; and Blair, Bryce Wilson, to AMP Incorporated. Single pole momentary switch. 3,967,085, Cl. 200-302.000.

Lockwood, John C., to Scripto, Inc. Cigarette lighter having improved valve means. 3,966,392, Cl. 431-344.000.

Loeliger, Peter: *See—*
Chodnekar, Madhukar Subraya; Loeliger, Peter; Pfiffner, Albert; Schwieter, Ulrich; Suchy, Milos; and Zurfluh, Rene, 3,966,780.

Loev, Bernard: *See—*
Roe, Anthony Maitland; Slater, Robert Antony; and Loev, Bernard, 3,966,946.
Van Hoeven, Helene E. Bowman; Brenner, L. Martin; and Loev, Bernard, 3,966,945.

Lofredo, Raymond A., to Industrial Innovations, Inc. Anti-rotational device for bolts and nuts. 3,965,954, Cl. 151-5.000.

Loftis, James B., to Joy Manufacturing Company. Drill mast support assembly. 3,965,628, Cl. 52-115.000.

Loftis, James B., to Joy Manufacturing Company. Drilling apparatus. 3,966,053, Cl. 211-60.00S.

Long, Harry L. Ironing boards. 3,965,588, Cl. 38-103.000.

Long, James Michael; and Osterlund, Paul Alan, to Evans Products Company. Electrode cooling apparatus. 3,967,047, Cl. 13-6.000.

Long, John V.: *See—*
Gagliani, John; and Long, John V., 3,966,652.

Longenecker, Levi S. Dual ring supported roof for electric arc furnace. 3,967,048, Cl. 13-35.000.

Longo, Robert T.: *See—*
Harnagel, Gary L.; and Longo, Robert T., 3,967,098.

Lonza Ltd.: *See—*
Gutmann, Walter; and Nicolet, Rene, 3,966,846.

Look, Robert A. Ski lock. 3,966,219, Cl. 280-611.000.

Lorang, Lucien: *See—*
Limpach, Raymond; and Lorang, Lucien, 3,966,457.

Lord Corporation: *See—*
Sherrick, James W., 3,965,825.

L'Oreal: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,966,722.
Papantoniou, Christos; and Grognet, Jean-Claude, 3,966,403.
Papantoniou, Christos; and Grognet, Jean-Claude, 3,966,404.
Vanlerberghe, Guy; and Sebag, Henri, 3,966,398.

Lorentz, Merle J.; and Salzman, Donald F. Animal exerciser. 3,965,866, Cl. 119-29.000.

Lorimer, John Wallace: *See—*
Robitschek, Paul; Chappelle, Norman Andrew; and Lorimer, John Wallace, 3,966,658.

Losenno, Luigi G. Multioperational latch. 3,966,245, Cl. 292-202.000.

Lotfallah, Lotfi H., to Gillette Company, The. Ball type marker construction which eliminates stick-slip phenomena. 3,966,336, Cl. 401-209.000.

Loughridge, Frederick A.: *See—*
Finch, William A.; Loughridge, Frederick A.; and Marcucci, Rudolf, 3,966,288.

Loyzim, Robert J., to Superior Electric Company, The. Power supply for a stepping motor. 3,967,179, Cl. 318-696.000.

Lozano, Davis S.: *See—*
Prussin, Samuel B.; and Lozano, Davis S., 3,966,090.

Lubov, Michael T. Boat propeller protective structure. 3,965,845, Cl. 115-42.000.

Lucas Electrical Company Limited, The: *See—*
Bowcott, Roy Price, 3,965,754.
Salway, Peter Hugh, 3,965,878.

Lucas, Larry D.; Schertz, Burtron D.; and Wilkinson, Lester, to General Motors Corporation. Signal seeking receiver stopping circuit. 3,967,203, Cl. 325-349.000.

Luciano, Franco Paolo, to Rachelle Laboratories Italia, S.p.A. Manufacture of 6-methylenetetracyclines. 3,966,808, Cl. 260-559.0AT.

Luck, John V., to SCM Corporation. Process for making solid sauce bar. 3,966,993, Cl. 426-589.000.

Ludwig, Frank A., to Ford Motor Company. Sodium sulfur battery or cell with improved ampere-hour capacity. 3,966,492, Cl. 136-6.0FS.

Ludwig, Peter J.; and Bird, Arnett L., to Dow Chemical Company, The. Thermoplastic molding compositions of rubber-reinforced styrene/-maleic anhydride resins and polycarbonate resins. 3,966,842, Cl. 260-873.000.

Luenberger, Frederick O., to Emerson Electric Co. Variable drive pulley construction. 3,965,766, Cl. 74-230.17A.

Lugowski, Ronald J.: *See—*
Dominick, George G.; Lugowski, Ronald J.; Goodrich, Phillip D.; and Erickson, Kenneth, 3,966,116.

Lukas, Fredric: *See—*
Anderson, Harold Peter; Lesser, George Albert; Lukas, Fredric; Maxon, Rodney Robert; and Viamour, James Hall, 3,967,073.

Luke, Michael O.: *See—*
Atkinson, Joseph G.; and Luke, Michael O., 3,966,781.

Lundin, Torgny Folke Vilhelm, to Jonsereds Fabrikers Aktiebolag. Planing machine. 3,965,948, Cl. 144-3.00R.

Lundquist, Ingemar H., to Origo, Incorporated. Measured volume drug administration device for use with intravenous feeding pump. 3,965,897, Cl. 128-214.00R.

Lupkas, Raymond R.; and Schubert, Keith E., to Pitney-Bowes, Inc. Setting mechanism for a postage printing device. 3,965,815, Cl. 101-91.000.

Lutz, Michael: *See—*
Hoffman, Louis S.; and Lutz, Michael, 3,966,083.

Lux, Ivan E. Method and apparatus for producing filled resins. 3,966,176, Cl. 259-108.000.

Lyman, Richard G. Flexible spirally wound conduit cutting device. 3,965,571, Cl. 30-90.200.

Lyon, Jack K., to Price Pfister Brass Mfg. Co. Single handled mixing valve. 3,965,936, Cl. 137-625.170.

Lyon, Ward L.: *See—*
Elikan, Leonard; Lyon, Ward L.; and Sundar, Parameshwaran S., 3,966,873.
Sundar, Parameshwaran; Elikan, Leonard; and Lyon, Ward L., 3,966,872.

Lysek, Franz, to Moeller-Werke GmbH. Accordion-pleated article of manufacture. 3,967,023, Cl. 428-102.000.

M & T Chemicals Inc.: *See—*
Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., 3,966,565.

M. W. Carr & Co., Inc.: *See—*
Paskerian, Wayne H., 3,965,600.

MacDonald, Ian M.; and Cowie, Charles J., to Eaton Corporation. Position synchronization of machines. 3,967,170, Cl. 318-85.000.

MacDonald, John Graham, to Dominion Road Machinery Co. Limited. Adjustable hydraulic control system for a motor grader. 3,965,771, Cl. 74-479.000.

MacDonald, Murdo A. Fastener driver and fastener holding nosepiece. 3,965,950, Cl. 145-52.000.

Macemon, James H.: *See—*
Soodak, Charles; and Macemon, James H., 3,967,113.

Mack Trucks, Inc.: *See—*
Licari, Vincent, 3,966,255.
Meacock, Leslie A., II; Schumaker, Donald R.; and Zalokar, Robert F., 3,966,009.

Mackey, Lindsay Joan: *See—*
Jarrett, William Fleming Hoggan; Jarrett, James Oswald; and Mackey, Lindsay Joan, 3,966,907.

Macriss, Robert A.: *See—*
Rush, William F.; Macriss, Robert A.; and Weil, Sanford A., 3,965,695.

Maddux, John F.: *See—*
Froberg, Magnus L.; and Maddux, John F., 3,967,046.

Madge Canter Associates, Inc.: *See—*
Muller, Fred, Jr.; Wolniak, Stanley; Johnson, Marshall; and Spencer, Elbert, 3,966,247.

Madonna Corporation: *See—*
Madonna, Thomas P., 3,965,624.

Madonna, Thomas P., to Madonna Corporation. Room ceiling construction with recessed dome mounted therein and the method of mounting the same. 3,965,624, Cl. 52-28.000.

Mae, Shinroku, to Motosuke Umezu. Apparatus for supplying objects to be bound to an automatic band-binding means. 3,965,811, Cl. 100-4.000.

Maeda, Hiroshi; Ariga, Nagao; and Matuo, Takeo, to Dainippon Ink and Chemicals, Incorporated. Process for the preparation of unsaturated polyurethane resins. 3,966,681, Cl. 260-75.0NH.

Maeda, Kikuo; and Tomimoto, Takashi, to Morita Pump Kabushiki Kaisha. Working range indicating device for aerial ladder truck. 3,966,017, Cl. 182-18.000.

Maeda, Shuichi: *See—*
Tokura, Katsuyuki; Maeda, Shuichi; Endo, Takeshi; Yoichizono, Kenji; and Asami, Hiroshi, 3,965,913.

Maekawa, Minoru, to Kuraray Co., Ltd. Process for the production of metal-plated staple fibers. 3,967,010, Cl. 427-306.000.

Maenicke, Eckart, to Siemens Aktiengesellschaft. Power supply for electronic circuits at high-voltage potential. 3,967,189, Cl. 323-76.000.

Magee, Audra Fay. Ornamental artificial tree. 3,967,019, Cl. 428-7.000.

Mages, Bernhard: *See—*
Rock, Erich; and Mages, Bernhard, 3,965,530.

Magherini, Dino. Die-testing press. 3,966,184, Cl. 269-37.000.

Magnani, Arthur, to SmithKline Corporation. 3-Substituted-5-hydroxy(mercapto)alkylidene-rhodanine derivatives. 3,966,942, Cl. 424-263.000.

Magnavox Company, The: *See—*
Zeger, Andrew E., 3,967,279.

Maguer, Pierre; and Gourlay, Paul, to Etat Francais. Sonar system for classifying submerged objects. 3,967,233, Cl. 340-3.00R.

Maguire, D. Bruce, to Emerson Electric Co. Label transport. 3,966,188, Cl. 271-9.000.

Maher, Anthony Ambrose: *See—*
Rawlings, Robert M.; and Maher, Anthony Ambrose, 3,966,998.

Maher, Philip K.: *See—*
Scherzer, Julius; and Maher, Philip K., 3,966,643.

Maher, Philip Kenerick; and McDaniel, Carl Vance, to W. R. Grace & Co. Thermal stable synthetic zeolite. 3,966,882, Cl. 423-328.000.

Maier, Bruce R. Brush and cleaning composition for phonograph records. 3,965,520, Cl. 15-104.940.

Maier, Jack K.: *See—*
Reich, Herbert A.; and Maier, Jack K., 3,967,262.

Maier, Johann H. Machine for the thermal expansion of rigid plastic tubing. 3,966,384, Cl. 425-392.000.

Maillard, Gilbert Albert Rene, to Manufacture de Machines du Haut-Rhin S.A. Double action revolver. 3,965,603, Cl. 42-65.000.

Makihara, Chiharu; and Yoda, Tohru, to Mitsubishi Electric Co.; and Nifco Inc. Strain grommet. 3,967,050, Cl. 174-135.000.

Mal, M. Kumar; and Tarkan, Stuart E. Grain refinement of titanium carbide tool steel. 3,966,423, Cl. 29-182.700.

Malaysian Rubber Producers' Research Association, The: *See—*
Cutts, Ernest; and Knight, Geoffrey Thomas, 3,966,530.

Maldonado, Paul: *See—*
Charpentier, Jean-Max; Glikmans, Georges; and Maldonado, Paul, 3,966,553.

Mallinckrodt, Inc.: *See—*
Glovsky, Joel; and Brown, James L., 3,966,896.

Malone, Charles Thomas: *See—*
Hunter, George L. K.; Krampl, Victor; Malone, Charles Thomas; and Usher, Gerald Edward, 3,966,986.

Malvestuto, Frank S., Jr. High speed water vessel. 3,965,836, Cl. 114-66.50R.

Malzahn, Ronald C.: *See—*
Morehouse, Alpha L.; and Malzahn, Ronald C., 3,966,971.

Mamantov, Gleb; Marassi, Roberto; and Chambers, James Q., to United States of America, Army. Molten salt electrochemical systems for battery applications. 3,966,491, Cl. 136-6.0LF.

Mamo, Anthony C.: *See—*
Cottrell, Harold L.; and Mamo, Anthony C., 3,965,680.

Mancy, Denise; Ninet, Leon; and Preud'homme, Jean, to Rhone-Poulenc S.A. Antibiotic 19,402 RP. 3,966,557, Cl. 195-80.00R.

Mandigo, Frank N.; and Sperry, Philip R., to Swiss Aluminium Ltd. Aluminum alloy sheet and process therefor. 3,966,506, Cl. 148-11.50A.

Mandon, Jean-Pierre: *See—*
Hennart, Claude; Rabussier, Bernard; and Mandon, Jean-Pierre, 3,966,900.

Mangold, Dietrich; Zeeh, Bernd; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. N-3,5-dichlorophenyloxazalidines. 3,966,750, Cl. 260-307.00B.

Manko, Nicholas L., to French Oil Mill Machinery Company, The. Replaceable wear strips and liner for baling press. 3,965,814, Cl. 100-245.000.

Manktelow, Paul W.: *See—*
Porch, Don E.; Manktelow, Paul W.; and Utz, James E., 3,966,285.

Manufacture de Machines du Haut-Rhin S.A.: *See—*
Maillard, Gilbert Albert Rene, 3,965,603.

Manufacture de Produits Chimiques Protex: *See—*
Ribba, Alain, 3,966,687.

Mao, Kao-Wen: *See—*
Gagnon, Eugene G.; and Mao, Kao-Wen, 3,966,571.

Marassi, Roberto: *See—*
Mamantov, Gleb; Marassi, Roberto; and Chambers, James Q., 3,966,491.

Marconi, Joseph. Blanking die and holder construction for punch presses. 3,965,784, Cl. 83-157.000.

Marcucci, Rudolf: *See—*
Finch, William A.; Loughridge, Frederick A.; and Marcucci, Rudolf, 3,966,288.

Marcus, Byron E., to Baxter Laboratories, Inc. Magnetic stirrer noise cancellation system. 3,966,333, Cl. 356-229.000.

Marechal, Bernard: *See—*
Selander, Stig Daniel; Marechal, Bernard; and D'Andrea, Corrado, 3,966,540.

Marine Colloids, Inc.: *See—*
Renn, Donald W.; and Saravis, Calvin A., 3,966,897.

Marine and Industrial Developments Limited: *See—*
Galatis, Telemachus Nicolas, 3,967,256.

Marinenko, George, to United States of America, Commerce. Electrochemical chlorine flux monitor. 3,966,413, Cl. 23-253.00R.

Markham, Robert D., to H C Products Co. Shelving structure. 3,965,826, Cl. 108-152.000.

Marks, Robert J. Furniture construction. 3,965,506, Cl. 5-345.00R.

Marlow, Darrell W., to Olin Corporation. Inflating device with self-contained propellant gas generating cartridge. 3,966,225, Cl. 280-737.000.

Maros, Ronald Richard: *See—*
Mathe, Istvan; and Maros, Ronald Richard, 3,966,293.

Mars, Inc.: *See—*
Heiman, Fred P.; and Schwippert, Guustaaf Arthur, 3,966,034.

Marston, Lloyd Everett: *See—*
Reubens, Clarence Edmond; Campbell, Sterrett Paxton; and Marston, Lloyd Everett, 3,965,654.

Marten, John Anthony. Method of coating a vehicle test bed rollers. 3,967,017, Cl. 427-405.000.

Martig, Kenneth W., Jr. Method and portable apparatus for continually monitoring the flow of fluid in an open channel. 3,965,740, Cl. 73-194.00R.

Martin, Jacques Lucien Joseph, to R.K.S. Societe Anonyme. Snappable open separators for the cage of rolling thrust bearing elements. 3,966,284, Cl. 308-235.000.

Martincic, Paul W.: *See—*
Moore, Curtis L.; and Martincic, Paul W., 3,967,051.

Martini, Thomas: *See—*
Lademann, Rudolf; Lindner, Helmut; Martini, Thomas; and Rammelt, Peter Paul, 3,966,832.

Martret, Odile Le; and Clemence, Francois, to Roussel-UCLAF. Novel therapeutic compositions and method involving thiazolcarboxamides. 3,966,950, Cl. 424-250.000.

Marty, Emil. Rigid and flexible mounting for reed-dent in a profiled stave. 3,965,940, Cl. 139-192.000.

Martz, Lyle F.; and Plotnick, Richard J., to Westinghouse Electric Corporation. Combined cycle electric power plant and a heat recovery steam generator having improved boiler feed pump flow control. 3,965,675, Cl. 60-39.18B.

Maruoka, Akira: *See—*
Nakano, Mineo; Koyama, Takeshi; Matsumoto, Yoshiro; and Maruoka, Akira, 3,966,390.

Maruska, William O., to United States of America, Air Force. Low spin-deceleration safing and arming mechanism. 3,965,821, Cl. 102-79.000.

Marx, Matthias: *See—*
Kovacs, Jenoe; Jung, Hans; Marx, Matthias; Spoor, Herbert; and Roschke, Wilfried, 3,966,655.

Marx, Michael, to Syntex (U.S.A.) Inc. Process for preparing β-nitroethanethiol. 3,966,825, Cl. 260-609.00R.

Marzocchi, Alfred; Jannarelli, Albert E.; and Garrett, David W., to Owens-Corning Fiberglas Corporation. Friction material for brake linings and the like. 3,967,037, Cl. 428-392.000.

Masaki, Hideyuki: *See—*
Kamigaito, Osami; Doi, Haruo; Masaki, Hideyuki; Kandori, Toshio; Oki, Masami; and Nakamura, Yasuo, 3,967,230.

Mason, Donald G.; and Higgins, Robert B., to Ecodyne Corporation. Liquid treatment apparatus. 3,966,608, Cl. 210-151.000.

Mason, Richard. Simulated golf green. 3,966,212, Cl. 273-181.00A.

Massa, Donald P., to Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees of the Stoneleigh Trust u/d/t Dec. 4, 1973. Intrusion alarm system with improved air turbulence compensation. 3,967,260, Cl. 340-258.00A.

Massey, Peyton L. Retractable shower shade with adjustable extensibility. 3,965,960, Cl. 160-295.000.

Massey, William A.: *See—*
Ferara, James T.; and Massey, William A., 3,966,518.

Masuda, Ikuro: *See—*
Isoo, Osamu; Matsuoka, Shinji; Matsuoka, Shigeru; Uno, Takeshi; Ikeda, Sadahiro; Masuda, Ikuro; and Kurokawa, Koji, 3,967,242.

Masuya, Hirotomo; and Miki, Takuichi, to Takeda Chemical Industries, Ltd. Production of 21-phosphate corticords having unprotected hydroxyl radicals at least at the 17α- and 21-position. 3,966,778, Cl. 260-397.450.

Mathe, Istvan; and Maros, Ronald Richard, to Bunker Ramo Corporation. Hood assembly for an electrical connector. 3,966,293, Cl. 339-103.00R.

Mathes, Robert C., to Bell Telephone Laboratories, Incorporated. Secret telephony. 3,967,066, Cl. 179-1.50R.

Mathews, Glenn William; and Wing, Milton Silas, to Dow Chemical Company, The. Modified hydrocarbon resins. 3,966,690, Cl. 526-283.000.

Mathieu, Hans; and Hochstrasser, Jurgen, to Hochstrasser nee Wack, Elisabeth; and Hochstrasser, Jurgen. Drilling grab for pile foundations and well boreholes. 3,965,999, Cl. 175-238.000.

Matiacio, George P.: *See—*
Schneller, Joseph W.; Bennett, Duane C.; and Matiacio, George P., 3,967,016.

Matoba, Shigetada: *See—*
Kakuta, Hisashi; Matoba, Shigetada; Shimizu, Kenichi; and Yamashita, Satoshi, 3,966,889.

Matsuda, Yasuhisa, to Copal Company Limited. Cassette for an endless type cinefilm. 3,966,134, Cl. 242-55.19A.

Matsumoto, Seiji, to Rank Xerox Ltd. Corona charging device. 3,967,119, Cl. 250-326.000.

Matsumoto, Seiji: *See—*
Fukushima, Osamu; Matsumoto, Seiji; and Sato, Masamichi, 3,965,861.

Matsumoto, Yoshiro: *See—*
Nakano, Mineo; Koyama, Takeshi; Matsumoto, Yoshiro; and Maruoka, Akira, 3,966,390.

Matsuoka, Shigeru: *See—*
Isoo, Osamu; Matsuoka, Shinji; Matsuoka, Shigeru; Uno, Takeshi; Ikeda, Sadahiro; Masuda, Ikuro; and Kurokawa, Koji, 3,967,242.

Matsuoka, Shinji: *See—*
Isoo, Osamu; Matsuoka, Shinji; Matsuoka, Shigeru; Uno, Takeshi; Ikeda, Sadahiro; Masuda, Ikuro; and Kurokawa, Koji, 3,967,242.

Matsuoka, Yoshio; Inomata, Hiroshi; Shimazaki, Tsuneo; and Takahata, Fujiya, to Hitachi, Ltd. Apparatus for producing timing signal for photometric measurement. 3,966,323, Cl. 356-96.000.

Matsushita Electric Corporation of America: *See*—
Dorren, Louis, 3,967,069.

Matsushita Electric Industrial Co., Ltd.: *See*—
Horiuchi, Masao, 3,967,088.
Kuroda, Makoto; Morimoto, Kazuhisa; and Minobe, Akira, 3,966,469.
Mikoda, Masanari; Akatani, Hisashi; and Hayakawa, Shigeru, 3,966,302.
Shinohara, Isao, 3,967,068.
Tada, Siro, 3,965,850.
Tetsugu, Yoshio; Mitsui, Tsunemi; and Minakuchi, Hiroshi, 3,967,200.

Mattalia, Gabriele, to Istituto Farmacologico Serono, S.P.A. Process for preparing synthetic L-pyroglutamyl-L-histidyl-L-prolinamide. 3,966,700, Cl. 260-112.5TR.

Mattel, Inc.: *See*—
Rhodes, Tony; and Gay, Derek John, 3,965,561.

Matthews, Hubert B. Method and apparatus for indicating the amount of torque in a yarn. 3,965,737, Cl. 73-160.000.

Mattori, Hiroaki; Mizuta, Takemi; and Okamoto, Shinzi, to Sharp Kabushiki Kaisha. Compensation for anti-skid brake control system. 3,966,264, Cl. 303-21.0BE.

Matty, Thomas C.; and Sahasrabudhe, Arun P., to Westinghouse Electric Corporation. Quad state receiver. 3,966,149, Cl. 246-34.00R.

Matuo, Takeo: *See*—
Maeda, Hiroshi; Ariga, Nagao; and Matuo, Takeo, 3,966,681.

Maurer, Albrecht: *See*—
Muller, Ernst; and Maurer, Albrecht, 3,965,783.

Maurer, Fritz: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lother; Behrenz, Wolfgang; Hammann, Ingeborg; Stendel, Wilhelm; and Homeyer, Bernhard, 3,966,730.

Max Sandherr AG: *See*—
Schellenberg, Walter, 3,966,114.

Maxon, Rodney Robert: *See*—
Anderson, Harold Peter; Lesser, George Albert; Lukas, Fredric; Maxon, Rodney Robert; and Viamour, James Hall, 3,967,073.

May, Edwin Richard Wells, to National Research Development Corporation. Methods and materials for joining silicon powder structures. 3,966,885, Cl. 423-344.000.

May, Hans-Joachim: *See*—
Baganz, Horst; and May, Hans-Joachim, 3,966,757.

Mayer, Abbott F.; and Morgan, David J., to Rockwell International Corporation. Direction finding system with integrated loop and sense antenna assembly. 3,967,280, Cl. 343-121.000.

Mayer, Salvador Escobar, Sr., to Dweck, David; Zalta, Maurice; Cohen, Camel; and Cohen, Robert, a part interest to each. Article including an endless coil spring. 3,966,183, Cl. 267-167.000.

Mayrose, William Carl: *See*—
Jones, Charles Alonzo; Lawson, Jerry Joe; and Mayrose, William Carl, 3,966,241.

Mazur, Adella. Multi-use infant garment. 3,965,487, Cl. 2-69.500.

Mazur, Yehuda; Freeman, Dalia; and Acher, Aureliu J., to Yeda Research & Development Co. Ltd. Process for the production of 1α-hydroxy provitamin D_3 and 1α-hydroxy vitamin D_3. 3,966,777, Cl. 260-397.200.

Mazzola, Ralph, to Ark-Les Switch Corporation. Flag terminal applying machine. 3,965,559, Cl. 29-203.0DT.

McAvoy, Bruce R., to Westinghouse Electric Corporation. Resonant ring transmission line having a high Q mode. 3,967,223, Cl. 333-82.00B.

McCain, David L.: *See*—
Doerr, Richard E.; McCain, David L.; and Davis, David H., 3,966,261.

McCain Manufacturing Corporation: *See*—
McCain, William B.; Cosgrove, James F.; and Zagorski, Edward J., 3,966,185.

McCain, William B.; Cosgrove, James F.; and Zagorski, Edward J., to McCain Manufacturing Corporation. Book making. 3,966,185, Cl. 270-37.000.

McCollum, Robert F., to Telex Computer Products, Inc. Tape excursion control means using tapered-wall vacuum column. 3,967,319, Cl. 360-90.000.

McCorkle, Richard E., to Joy Manufacturing Company. Gas sampling system and method. 3,965,747, Cl. 73-421.50R.

McCornack, Robert R. Anti-siphon flush valve construction. 3,965,922, Cl. 137-218.000.

McCorquodale Colour Display Limited: *See*—
Blake, Charles William, 3,967,009.

McCown, Rainer F., to United States of America, Air Force. Self-adjusting digital notch filter. 3,967,102, Cl. 235-152.000.

McCoy, Robert A.; and Moreland, William C., II, to Westinghouse Corporation. Cooking vessel for use with induction heating cooking unit. 3,966,426, Cl. 29-196.200.

McCreary, Terrance J.: *See*—
Clark, Robert V.; Linder, Francis X.; McCreary, Terrance J.; and Taylor, William R., 3,967,283.

McCullough, John R.: *See*—
Schramm, Harold J., deceased; McCullough, John R.; and Yarnall, Joseph P., 3,966,854.

McCurdy, Donald L., to Amerock Corporation. Door lock with decorative escutcheon. 3,965,710, Cl. 70-452.000.

McDaniel, Carl Vance: *See*—
Maher, Philip Kenerick; and McDaniel, Carl Vance, 3,966,882.

McDermott, Clifton Eugene, to Bio-Logics Products, Inc. Identification means. 3,965,589, Cl. 40-21.00C.

McDonnell Douglas Corporation: *See*—
Cachuela, Lawrence P.; and Sanford, George G., Jr., 3,967,103.
Zuleeg, Rainer, 3,967,305.

McDonough Co.: *See*—
Eads, Harold O.; and Robison, James W., 3,965,991.

McEathron, Eugene Douglas, to General Signal Corporation. Fluid brake control system. 3,966,269, Cl. 303-37.000.

McEathron, Eugene Douglas, to General Signal Corporation. Fluid brake control system. 3,966,270, Cl. 303-69.000.

McEathron, Eugene Douglas, to General Signal Corporation. Fluid brake control system. 3,966,271, Cl. 303-69.000.

McEvoy Oilfield Equipment Co.: *See*—
Beson, John, 3,965,977.

McFarland, James W.; and Thomson, Colin, to Pfizer Inc. Aminomethylarylmethylpenicillin derivatives. 3,966,710, Cl. 260-239.100.

McGarvey, Robert E.; and Gitthens, Donald L. Hydraulic safety valve base. 3,965,919, Cl. 137-107.000.

McGee, Richard R.: *See*—
Moore, Harry W., III; and McGee, Richard R., 3,967,059.

McGinniss, Vincent D.: *See*—
LaBash, John David; and McGinniss, Vincent D., 3,966,574.

McGivern, James P.: *See*—
Whyte, Ian A.; Ottobre, Louis G.; and McGivern, James P., 3,967,264.

McGouey, Richard P.: *See*—
Almasi, George S.; Hendel, Robert J.; Keefe, George E.; Lin, Yeong S.; and McGouey, Richard P., 3,967,002.

McGowan, Joseph W., to United States of America, Army. Edge-guided wave directional combiner. 3,967,218, Cl. 333-1.100.

McGuckian, Ambrose T., to A.G.S. Food System Inc. Method of cooking and storing food in flexible bags. 3,966,980, Cl. 426-393.000.

McKee, William H., to TRW Inc. Wire termination apparatus. 3,965,558, Cl. 29-203.0MW.

McKenna, Henry Alvin, to Ocean Systems, Inc. Traction winch. 3,966,170, Cl. 254-175.700.

McLaughlin, Carol Lynn: *See*—
Baile, Clifton A.; Gallagher, Gregory; McLaughlin, Carol Lynn; and Webb, Robert Lee, 3,966,958.

McLaughlin, David Benjamin: *See*—
Jakobsen, Karl Severin; and McLaughlin, David Benjamin, 3,966,523.

McMillan, Charles G. Broken needle removal tool for knitting machines. 3,965,777, Cl. 81-5.10R.

McNair, Samuel L., to Dazey Products Company. Hydrotherapy foot tub having heating and massaging means. 3,965,495, Cl. 4-182.000.

McNeil Laboratories, Incorporated: *See*—
Paragamian, Vasken; and Taylor, Russell J., Jr., 3,966,935.

McNinch, Joseph H., Jr.; Urban, John A.; and Hopkins, Gary L., to Eaton Corporation. Skid control system. 3,966,267, Cl. 303-21.0BE.

McRee, Robert E., Jr., to Environmental Control Products, Inc. Waste feeding apparatus for incinerator. 3,965,828, Cl. 110-8.00R.

Meacock, Leslie A., II; Schumaker, Donald R.; and Zalokar, Robert F., to Mack Trucks, Inc. Vehicle cab mounting arrangement. 3,966,009, Cl. 180-89.00A.

Mead Johnson & Company: *See*—
Hopkins, Brian D., 3,966,082.

Mead, Theodore C.: *See*—
Harrison, Charles W.; Mead, Theodore C.; Moreland, Howard R.; and Barger, Frank L., 3,965,723.

Meadus, Frederick Weldon; Sparks, Bryan David; and Puddington, Ira Edwin, to Canadian Patents and Development Limited. Pressure sensitive coatings. 3,967,034, Cl. 428-323.000.

Medac Gesellschaft fur Klinische Spezialpraparate mbH: *See*—
Heimes, Horst Peter; and Reul, Helmut, 3,966,358.

Medical Specialties, Inc.: *See*—
Johns, Herman S., 3,965,785.

Medlin, William L., to Mobil Oil Corporation. Hydraulic fracturing method for creating horizontal fractures. 3,965,982, Cl. 166-249.000.

Medrad, Inc.: *See*—
Waddell, Seid W.; and Heilman, Marlin S., 3,965,909.

Meininger, Fritz; Hunger, Klaus; and Springer, Hartmut, to Hoechst Aktiengesellschaft. Naphthylazo naphthyl copper complex dyestuffs. 3,966,704, Cl. 260-150.000.

Meiser, Werner: *See*—
Westphal, Kurt; Meiser, Werner; Eue, Ludwig; and Hack, Helmuth, 3,966,715.

Meister, Werner: *See*—
Edl, Wolfgang; Meister, Werner; and Seidl, Hans, 3,966,840.

Mekantransport AB: *See*—
Banner, Kurt A., 3,966,545.

Melacini, Paolo; Patron, Luigi; Doria, Giorgio; and Tedesco, Raffaele, to Montefibre S.p.A. Continuous process for preparing a spinning solution of acrylic polymers. 3,966,666, Cl. 260-32.60N.

Mellin, Juha: *See*—
Heikkila, Viekko; Hakkinen, Leo; Strom, Rolf; Uusitalo, Leo; and Mellin, Juha, 3,966,019.

Melville, William, to Imperial Metal Industries (Kynoch) Limited. Manufacture of solid metal spherical articles. 3,965,549, Cl. 29-1.220.

Mentrup, Anton: *See—*
Schromm, Kurt; Mentrup, Anton; Renth, Ernst-Otto; and Traunecker, Werner, 3,966,814.
Menzies, William R., III: *See—*
Bittensky, Joel S.; Dillingham, Edward W.; Menzies, William R., III; and Pratt, Roy E., 3,966,587.
Merck & Co., Inc.: *See—*
Colegrove, George T., 3,966,618.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 3,966,966.
Schuppner, Harry R., Jr.; and Randel, John H., 3,966,976.
Merck Sharp & Dohme (I.A.) Corporation: *See—*
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Merckel, Gerard: *See—*
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Merianos, John J.: *See—*
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Merker, Walter H., Jr.: *See—*
Duquette, Francis H.; and Merker, Walter H., Jr., 3,966,057.
Mermi, Kurt: *See—*
Frischmann, Albert; Mermi, Kurt; Hermeneit, Rainer; and Koniger, Rudolf, 3,966,156.
Merten, Rudolf; Lewalter, Jurgen; and Zecher, Wilfried, to Bayer Aktiengesellschaft. Process for the preparation of compounds which contain hydantoin groups. 3,966,683, Cl. 260-77.5AC.
Mesek, Frederick K.; and Repke, Virginia L., to Johnson & Johnson. Disposable diaper. 3,965,904, Cl. 128-284.000.
Messer, Mayer Naoum: *See—*
Jeanmart, Claude; Leger, Andre; and Messer, Mayer Naoum, 3,966,931.
Mester, Joseph H. Exercising machine. 3,966,201, Cl. 272-72.000.
Meszaros, Lajos: *See—*
Rozsa, Laszlo; Meszaros, Lajos; and Mogyorodi, Ferenc, 3,966,786.
Metalife Company, The: *See—*
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Metallgesellschaft Aktiengesellschaft: *See—*
Bratzler, Karl; and Doerges, Alexander, 3,966,875.
Scheiber, Werner, 3,965,854.
Metcalf, Robert L.; Kapoor, Inder; and Hirwe, Asha, to University of Illinois Foundation. p,p'-Disubstituted α-trichloromethylbenzylphenyl ethers. 3,966,824, Cl. 260-612.00R.
Metropolitan Industries, Inc.: *See—*
Renkert, John S., 3,965,635.
Mettoy Company Limited, The: *See—*
Nicholls, Bryan Frederick, 3,965,930.
Metzger, Karl Georg: *See—*
Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, 3,966,709.
Metzler, Richard Bruce: *See—*
Johnson, Gordon Carlton; Metzler, Richard Bruce; and Bailey, Donald Leroy, 3,967,030.
Metzler, Robert P., to RPM Marketing Enterprises, Inc. Trailer aligner. 3,966,231, Cl. 280-477.000.
Meunier, Pierre: *See—*
Baylac, Bernard; Merckel, Gerard; and Meunier, Pierre, 3,967,208.
Meyer, Engel A., to USM Corporation. Clip for remote control rod. 3,966,155, Cl. 248-73.000.
Meyer, Gerhard: *See—*
Toth, Anton; and Meyer, Gerhard, 3,966,726.
Meyer, Gunther: *See—*
Frick, Siegmund; Gresser, Wilhelm; Meyer, Gunther; and Bier, Gerhard, 3,966,673.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. 2-Amino-4 H-pyrane. 3,966,767, Cl. 260-332.20A.
Meyer, Leonard S. Archery bow. 3,965,883, Cl. 124-24.00R.
Meyer, Willy: *See—*
Bohner, Beat; Dawes, Dag; Meyer, Willy; Kristinsson, Haukur; and Rufenacht, Kurt, 3,966,754.
Meyers, Joseph P.: *See—*
Bakker, Lubertus, 3,966,886.
Michael, Farid Y., to Brown & Root, Inc. Vessel having improved wave response characteristics. 3,965,837, Cl. 114-125.000.
Michael, Ronnie L. Automotive rear main bearings. 3,965,880, Cl. 123-196.00R.
Michel, Eberhard, to Siemens Aktiengesellschaft. Pressurized-water coolant reactor installation. 3,966,549, Cl. 176-65.000.
Michelson, Robert A.: *See—*
Hyner, Jacob; and Michelson, Robert A., 3,966,564.
Mid America Sales Co., Inc: *See—*
Geisel, Dennis M., 3,966,073.
Mieras, Raymond J.: *See—*
Kieldsen, William E.; and Mieras, Raymond J., 3,965,809.
Mihara, Osamu, to Asahi Kasei Kogyo Kabushiki Kaisha. Endless belt propulsion device for a high speed boat. 3,965,846, Cl. 115-64.000.
Miki, Hidefumi: *See—*
Oda, Kouzou; and Miki, Hidefumi, 3,967,004.
Miki, Takuichi: *See—*
Masuya, Hirotomo; and Miki, Takuichi, 3,966,778.
Mikoda, Masanari; Akatani, Hisashi; and Hayakawa, Shigeru, to Matsushita Electric Industrial Co., Ltd. Panel for liquid crystal display and method of making. 3,966,302, Cl. 350-160.0LC.
Miles, Nelson J.: *See—*
Schwan, Thomas J.; and Miles, Nelson J., 3,966,758.
Milke, Howard W.; and Sadoski, Tadius T., to GTE Sylvania Incorporated. Fluorescent lamp having electrically conductive coating and a protective coating therefor. 3,967,153, Cl. 313-489.000.
Milkowski, Wolfgang; Zeugner, Horst; von Eickstedt, Klaus-Wolf; and Stuhmer, Werner, to Kali-Chemie Aktiengesellschaft. 1-3-(4-Fluorobenzoyl)propyl-4-substituted phenoxy ethyl piperazine. 3,966,735, Cl. 260-268.00R.
Mill & Mix Company, Inc.: *See—*
Stevens, Harold E., deceased, 3,966,178.
Millar, Philip Glenn: *See—*
Cassidy, John Edward; and Millar, Philip Glenn, 3,966,482.
Miller, Arthur F.: *See—*
Callahan, James L.; Miller, Arthur F.; and Shaw, Wilfrid G., 3,966,639.
Miller, Henry F., to Uniroyal Inc. Weighing apparatus. 3,966,003, Cl. 177-211.000.
Miller Hydro Company: *See—*
Nussbaum, Herbert H., 3,965,650.
Miller, Jan D.; and Jimenez, Juan Luis Sepulveda, to University of Utah, The. Selective removal of bismuth from oxidized particulate materials. 3,966,461, Cl. 75-101.00R.
Miller, Jess. Nut cracker. 3,965,810, Cl. 99-581.000.
Miller, Lloyd Edward, Jr. Asymmetrical divider block for a rotary displacement engine. 3,965,869, Cl. 123-8.450.
Miller, O. Neal: *See—*
Guthrie, Robert William; Hamilton, James Guthrie; Kierstead, Richard Wightman; Miller, O. Neal; and Sullivan, Ann Clare, 3,966,772.
Miller, Stewart Edward, to Bell Telephone Laboratories, Incorporated. Axial fabrication of optical fibers. 3,966,446, Cl. 65-2.000.
Milligan, Hugh E.: *See—*
Driscoll, Richard E.; and Milligan, Hugh E., 3,966,692.
Millmaster Onyx Corporation: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 3,966,904.
Mills, Noel; and Warley, Geoffrey Peter, to Westland Aircraft Limited. Methods of detecting underwater objects and apparatus therefor. 3,967,232, Cl. 340-2.000.
Milman, Boris Samoilovich: *See—*
Alexandrov, Nikolai Nikitievich; Zorev, Nikolai Nikolaevich; Krapukhin, Viktor Mikhailovich; Krotov, Viktor Vasilievich; Kryanin, Ivan Romanovich; Milman, Boris Samoilovich; Semenov, Pavel Vladimirovich; Sokolov, Nikolai Anatolievich; and Tinyakov, Viktor Gurievich, 3,965,968.
Mims, George P., to Vorus, Sandra J. Autopsy apparatus for assisting the cutting of brain tissue. 3,965,573, Cl. 30-124.000.
Minagawa, Kenichiro: *See—*
Tanizaki, Yoshiharu; Kawaguchi, Hiroshi; and Minagawa, Kenichiro, 3,966,625.
Minakuchi, Hiroshi: *See—*
Tetsugu, Yoshio; Mitsui, Tsunemi; and Minakuchi, Hiroshi, 3,967,200.
Minami, Teruo; and Uenoyama, Masaru, to Kabushiki Kaisha Komatsu Seisakusho. Retarder control device. 3,966,011, Cl. 180-105.00E.
Minemura, Norihiro: *See—*
Namiki, Hiroshi; Minemura, Norihiro; Kimura, Takeo; and Takahashi, Shigeru, 3,966,406.
Miner Enterprises, Inc.: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
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Miram, George V.: *See—*
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Mitchell, Kenneth J.; and Ostermeier, Kurt W., to Kimberly-Clark Corporation. Method of bonding fibrous webs and resulting products. 3,966,519, Cl. 156-73.100.
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Coquelet, Andre; and Nepote, Alain, 3,966,140.
Mitsubishi Chemical Industries Ltd.: *See—*
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Mitsui, Tsunemi: *See—*
Tetsugu, Yoshio; Mitsui, Tsunemi; and Minakuchi, Hiroshi, 3,967,200.

Mitsuoka, Hiroshi; and Kumano, Masayoshi, to Mitsubishi Denki Kabushiki Kaisha. Device for firing thyristor. 3,967,138, Cl. 307-252.00J.

Mitter & Co.: *See—*
Mitter, Mathias, 3,965,816.

Mitter, Mathias, to Mitter & Co. Drive for rotary screen printer utilizing the roller squeegee. 3,965,816, Cl. 101-115.000.

Mittler, Anton: *See—*
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Goetti, Hans; Mittler, Anton; and Forrer, Hermann, 3,965,664.

Miura, Hiroshi: *See—*
Tashiro, Norio; and Miura, Hiroshi, 3,967,154.

Miyamoto, Seiji, to Sanyo Electric Co., Ltd. Chrominance signal gain control circuit. 3,967,313, Cl. 358-27.000.

Miyata, Kenzi, to Hitachi, Ltd. Semiconductor device with a semiconductor substrate having dielectrically isolated functional regions. 3,967,309, Cl. 357-49.000.

Miyazaki, Takao: *See—*
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Mizoguchi, Katsuhiro: *See—*
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Mizote, Hiroyuki: *See—*
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Mizukami, Etsuo: *See—*
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Mizuki, Eiichi: *See—*
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Mizuno, William G.; and Henderson, Iris N., to Economics Laboratory, Inc. Treatment of fabrics in machine dryers. 3,967,008, Cl. 427-242.000.

Mizusawa, Shinichiro: *See—*
Okano, Ryoichi; Bunda, Tsuchio; Mizusawa, Shinichiro; and Morita, Akiyoshi, 3,966,443.

Mizuta, Takemi: *See—*
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Mizutani, Toshio: *See—*
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Moberly Company, The: *See—*
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Mobil Oil Corporation: *See—*
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Mogyorodi, Ferenc: *See—*
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Mohler, Galen E., to Lexel Corporation. Adjustable mounting structure for optical device. 3,966,309, Cl. 350-310.000.

Mohler, Galen E., to Lexel Corporation. Laser power meter. 3,966,325, Cl. 356-218.000.

Mohr, Ekkehard. Treating waste discharge liquids from metal hardening baths, particularly containing nitrite and nitrate compounds. 3,966,508, Cl. 148-15.000.

Mohr, Reinhard; and Hahnke, Manfred, to Hoechst Aktiengesellschaft. N-Alkyl nitro phenyl diethylene triamine dyeing of acid modified synthetic fibers. 3,966,405, Cl. 8-168.00A.

Molins Machine Company, Inc.: *See—*
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Molitor, Victor D. Purifier. 3,966,433, Cl. 55-66.000.

Molten Metal Engineering Co.: *See—*
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Momota, Kenzo: *See—*
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Monarch Marking Systems, Inc.: *See—*
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Newberry, John T., 3,966,136.

Monkovic, Ivo; Saucier, Michel; Lambert, Yvon; and Montzka, Thomas Alfred, to Bristol-Myers Company. 9-Hydroxy-6,7-benzomorphans. 3,966,747, Cl. 260-293.540.

Monsanto Company: *See—*
Ballman, Richard L.; Lea, Kenneth R.; Nunning, Walter J.; and Southern, John H., 3,966,866.
Hagberg, Carl G., 3,966,538.
Intille, George M.; and Beck, Gary R., 3,966,798.
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Perry, Eli; and Strazik, William F., 3,966,834.
Schleppnik, Alfred A., 3,966,648.
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Monsheimer, Rolf; and Pfleiderer, Ernst, to Rohm GmbH. Method for preparing tannable pelts from animal skins and hides. 3,966,551, Cl. 195-6.000.

Montagna, Angelo A.: *See—*
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Montanari, Lucio: *See—*
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Montefibre S.p.A.: *See—*
Melacini, Paolo; Patron, Luigi; Doria, Giorgio; and Tedesco, Raffaele, 3,966,666.

Montzka, Thomas Alfred: *See—*
Monkovic, Ivo; Saucier, Michel; Lambert, Yvon; and Montzka, Thomas Alfred, 3,966,747.

Moody, Roy A.: *See—*
Caveney, Jack E.; and Moody, Roy A., 3,965,538.

Moore Business Forms, Inc.: *See—*
D'Luhy, Emil, 3,965,786.

Moore, Curtis L.; and Martincic, Paul W., to Westinghouse Electric Corporation. Cast resin capacitor bushing having spacer members between the capacitor sections and method of making same. 3,967,051, Cl. 174-143.000.

Moore, David M., to Armstrong Store Fixture Corporation. Clip for mounting a crossbar to a bracket. 3,965,540, Cl. 24-84.00R.

Moore, Harry W., III; and McGee, Richard R., to Sperry Rand Corporation. Bi-directional logic system. 3,967,059, Cl. 178-58.00A.

Moore, Robert E.: *See—*
Duling, Irl N.; Gates, David S.; Glazier, Frederick P.; Moore, Robert E.; and Newingham, Thomas D., 3,966,624.

Morehouse, Alpha L.; and Malzahn, Ronald C., to Grain Processing Corporation. Separation of protein from vegetable sources. 3,966,971, Cl. 426-44.000.

Moreland, Howard R.: *See—*
Harrison, Charles W.; Mead, Theodore C.; Moreland, Howard R.; and Barger, Frank L., 3,965,723.

Moreland, William C., II: *See—*
McCoy, Robert A.; and Moreland, William C., II, 3,966,426.

Moretti, John A., to General Motors Corporation. Vehicle fuel economy calculator and indicator. 3,967,097, Cl. 235-150.210.

Morgan, David J.: *See—*
Mayer, Abbott F.; and Morgan, David J., 3,967,280.

Morimoto, Kazuhisa: *See—*
Kuroda, Makoto; Morimoto, Kazuhisa; and Minobe, Akira, 3,966,469.

Morimoto, Kiyoshi; Utamura, Yukihiko; and Takagi, Toshinori, to Futaba Denshi Kogyo K.K. Method and apparatus for making phosphors. 3,967,125, Cl. 250-432.00R.

Morioka, Yasuaki: *See—*
Ito, Shunji; Morioka, Yasuaki; Kajinaga, Yoshihiro; Nitta, Minoru; and Sakurada, Ichio, 3,966,454.

Morisseau, Bernard Jean Harry. Mixer tap. 3,965,935, Cl. 137-625.400.

Morita, Akiyoshi: *See—*
Okano, Ryoichi; Bunda, Tsuchio; Mizusawa, Shinichiro; and Morita, Akiyoshi, 3,966,443.

Morita Pump Kabushiki Kaisha: *See—*
Kozai, Tetsuo; and Shiraki, Shomitsu, 3,966,018.
Maeda, Kikuo; and Tomimoto, Takashi, 3,966,017.

Moriya, Mamoru, to Seiki Hanbai Co., Ltd. Interior structure frame assembly. 3,966,342, Cl. 403-405.000.

Moriya, Takao; Murano, Kazuo; and Fujikawa, Syunji, to Fujitsu Ltd. Two wires time sharing two way full duplex communication system. 3,967,058, Cl. 178-58.00R.

Moriyama, Hiromi; and Kuwabara, Motosuke, to Hitachi, Ltd. Attendant board system in a telephone exchange. 3,967,075, Cl. 179-98.000.

Morlet, Jean G.: *See—*
Honnorat, Yves C.; Raisson, Gerard D.; and Morlet, Jean G., 3,966,374.

Morris, Harold D., to Systron Donner Corporation. Wide band angular displacement and velocity sensor and method. 3,967,178, Cl. 318-648.000.

Morris, Max O. Twist lock connector. 3,966,340, Cl. 403-353.000.

Morton, Clyde M. Converter vaporizer. 3,965,871, Cl. 123-25.00B.

Morton-Norwich Products, Inc.: *See—*
Pelosi, Stanford S., Jr., 3,966,771.
Schwan, Thomas J., 3,966,740.
Schwan, Thomas J.; and Miles, Nelson J., 3,966,758.
Schwan, Thomas J., 3,966,759.
Schwan, Thomas J.; Davis, Charles S.; and Honkomp, Leroy J., 3,966,760.

Moser, Peter: *See—*
Patuzzi, Alexander; Eysn, Manfred; and Moser, Peter, 3,966,180.

Moser, Rabin, to Xerox Corporation. Contact fuser assembly. 3,965,853, Cl. 118-60.000.

Moskowitz, Gerard J.: *See—*
Cayle, Theodore; and Moskowitz, Gerard J., 3,966,543.

Mostek Corporation: *See—*
Donnelly, Robert Murray, 3,967,252.

Motoda, Kenro. Arm mechanism for moving heavy materials in a two-dimensional plane. 3,965,770, Cl. 74-471.0XY.

Motorola, Inc.: *See—*
Sample, Lawrence Ray, 3,967,312.

Motosuke Umezu: *See—*
Mae, Shinroku, 3,965,811.

Motting, Gotz: *See—*
Kleisser, Werner; and Motting, Gotz, 3,966,244.

Mourier, Georges: *See—*
Chavanat, Paul; Epsztein, Bernard; and Mourier, Georges, 3,967,155.

Muckenhaupt, Otto: *See—*
Korn, Siegfried; Kratzer, Bernd; and Muckenhaupt, Otto, 3,966,311.

Muehlbauer, James H., to George Koch Sons, Inc. Spray finishing tunnel. 3,965,805, Cl. 98-115.0SB.

Muench, Elmer W.: *See—*
Wysocki, Lawrence E.; and Muench, Elmer W., 3,965,932.

Muir, David Michael: *See—*
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, 3,966,890.

Mukushi, Toshimi; Izumi, Kenkichi; Takahashi, Sankichi; Okazima, Yoshiaki; Sawa, Toshio; and Komai, Mithumasa, to Agency of Industrial Science & Technology. Multi-stage flash distillation plant. 3,966,562, Cl. 202-173.000.

Muller, Ernst; and Maurer, Albrecht, to Bizerba-Werke Wilhelm Kraut K.G. Automatic slicing machine for food stuffs. 3,965,783, Cl. 83-88.000.

Muller, Fred, Jr.; Wolniak, Stanley; Johnson, Marshall; and Spencer, Elbert, to Madge Canter Associates, Inc. Keyless padlock. 3,966,247, Cl. 292-318.000.

Muller, Fritz: *See—*
Pfost, Karl, 3,965,813.

Muller, Heinz; Szonn, Bodo; Jauchen, Peter; and Schulze, Rolf, to Beiersdorf Aktiengesellschaft. Sealed foam web. 3,967,028, Cl. 428-214.000.

Muller, Karl Adolf: *See—*
Feldmann, Rainer; Kriesten, Wolfgang; Muller, Karl Adolf; Panoch, Hans Joachim; and Scholten, Heinz, 3,966,838.

Muller, Karl Heinz: *See—*
Kleiner, Frank Gerald; and Muller, Karl Heinz, 3,966,651.

Muller, Klaus; and Bohm, Bernhard, to Siemens Aktiengesellschaft. Cooling system for a nuclear reactor. 3,966,548, Cl. 176-37.000.

Muller, Richard S.; and Russell, Lewis K., to Signetics Corporation. Lateral bipolar transistor for integrated circuits and method for forming the same. 3,967,307, Cl. 357-35.000.

Muncie, Fred W., deceased: *See—*
Cocke, Emory L.; Muncie, Fred W., deceased; and Muncie, John W., executor, 3,966,984.

Muncie, John W., executor: *See—*
Cocke, Emory L.; Muncie, Fred W., deceased; and Muncie, John W., executor, 3,966,984.

Munting, Johannes Pieter, to Akzona Incorporated. Manufacture of unique polyethylene terephthalate fiber. 3,966,867, Cl. 264-210.00F.

Muoio, Erland L., to S. C. Johnson & Son, Inc. Impregnated wiper. 3,965,518, Cl. 15-104.930.

Murai, Hiromu; Ohata, Katsuya; Aoyagi, Yoshiaki; Ueda, Fusao; Kitano, Masahiko; Takata, Satoshi; and Tada, Shinichi, to Nippon Shinyaku Co., Ltd. Benzoguanamine derivatives. 3,966,728, Cl. 260-249.900.

Muramatu, Akira; and Kawata, Kiyoshi, to Omron Tateisi Electronics Co. Traffic signal control device with core memory. 3,967,245, Cl. 340-172.500.

Murano, Kazuo: *See—*
Moriya, Takao; Murano, Kazuo; and Fujikawa, Syunji, 3,967,058.

Murao, Kenji: *See—*
Toriyama, Kazuhisa; Abe, Hidetoshi; Nakano, Fumio; Murao, Kenji; and Sato, Mikio, 3,966,631.

Murenbeeld, Karel: *See—*
Ferrier, Duncan Cameron; Berry, Thomas; and Murenbeeld, Karel, 3,965,547.

Murphy, Wesley T., to Vercon Products, Inc. Modular building. 3,965,634, Cl. 52-403.000.

Murray, Ian P.; and Forte, Mark R., to Howmedica, Inc. Femoral insert for hip joint prosthesis. 3,965,490, Cl. 3-1.913.

Murray, Jerome L.; and Gardiner, Frances R. Hygienic douche system. 3,965,899, Cl. 128-225.000.

Music Circuit Productions, Inc.: *See—*
White, Stevan C., 3,965,625.

MX Processor Reinhardt & Co. AB: *See—*
Reinhardt, Hans; and Ottertun, Harald Daniel, 3,966,569.

Mylari, Banavara L., to Pfizer Inc. Esters of quinoxaline-1,4-dioxides. 3,966,951, Cl. 424-250.000.

N L Industries, Inc.: *See—*
Rutt, Truman C., 3,965,552.

N.P.I. Corporation: *See—*
Baker, Edward D., 3,965,807.

Naber, Jaap E.: *See—*
Groenendaal, Willem; Taubert, Friedrich C.; Naber, Jaap E.; and Bekker, Gijsbertus A., 3,966,879.

Nadler, Marshall. Method and apparatus for attaching and locking an article to a mounting structure. 3,965,705, Cl. 70-58.000.

Nagahama, Shizuo: *See—*
Shimada, Keizo; Nishikawa, Takeo; Harada, Toshiaki; and Nagahama, Shizuo, 3,966,830.

Nagahori, Tetsuo: *See—*
Taniyama, Yukio; Isaka, Tetsuo; Nagahori, Tetsuo; and Kanda, Kaoru, 3,967,249.

Nagano, Akio: *See—*
Watanabe, Akinori; Tanoshima, Katsuhide; Ando, Takao; Tohama, Akira; and Nagano, Akio, 3,967,143.

Nagashima, Motoi, to Cima Kogaku Company Limited. Shutter controlled film advancing apparatus. 3,967,291, Cl. 354-171.000.

Nagashima, Saburo: *See—*
Kurata, Tokuzo; Okano, Takeshi; Tamaru, Akio; Kato, Yozo; and Nagashima, Saburo, 3,966,810.

Nagayama, Tomoshi: *See—*
Hasegawa, Haruo; Taniguchi, Hiroyoshi; Yamane, Shiro; Igawa, Takao; and Nagayama, Tomoshi, 3,966,471.

Nagy, Alexander J.: *See—*
Osiadacz, William J.; and Nagy, Alexander J., 3,965,536.

Najer, Henry: *See—*
Giudicelli, Don Pierre Rene Lucien; Najer, Henry; Iliesco-Branceni, Bogdan; and Pascal, Yves Robert Alain, 3,966,745.

Nakagawa, Kenji: *See—*
Asahara, Yoshiyuki; Izumitani, Tetsuro; and Nakagawa, Kenji, 3,966,448.

Nakaguma, Kazuyoshi: *See—*
Saito, Jiro; Kimura, Kaoru; Kusuhara, Hiroshi; and Nakaguma, Kazuyoshi, 3,965,686.

Nakai, Yoshinobu; Yamamoto, Keiji; and Nakano, Masahiro. Method of treatment of medicines. 3,966,899, Cl. 424-19.000.

Nakamura Kinzoku Kogyosho, Inc.: *See—*
Enomoto, Michitoshi, 3,966,240.

Nakamura, Michio: *See—*
Otouma, Takashi; and Nakamura, Michio, 3,967,043.

Nakamura, Yasuo: *See—*
Kamigaito, Osami; Doi, Haruo; Masaki, Hideyuki; Kandori, Toshio; Oki, Masami; and Nakamura, Yasuo, 3,967,230.

Nakano, Fumio: *See—*
Toriyama, Kazuhisa; Abe, Hidetoshi; Nakano, Fumio; Murao, Kenji; and Sato, Mikio, 3,966,631.

Nakano, Masahiro: *See—*
Nakai, Yoshinobu; Yamamoto, Keiji; and Nakano, Masahiro, 3,966,899.

Nakano, Mineo; Koyama, Takeshi; Matsumoto, Yoshiro; and Maruoka, Akira, to Hitachi Chemical Company, Ltd. Mold for polyimide, polyamide, or polyamide-imide resin which has noble metal layer on its surface to be in contact with resin. 3,966,390, Cl. 425-470.000.

Nakasaki, Eiji, to Sumitomo Rubber Industries, Ltd. Vehicle wheel structure. 3,965,957, Cl. 152-400.000.

Nakayabu, Toshio: *See—*
Aoki, Atsushi; Fukuda, Rikiya; Nakayabu, Toshio; Ishibashi, Keijiro; Takeichi, Chiyoko; and Ishida, Mitsuo, 3,966,914.

Nalco Chemical Company: *See—*
Braithwaite, David G.; and Allain, Ronald J., 3,966,888.
Gossage, Robert V., 3,966,698.

Namiki, Hiroshi; Minemura, Norihiro; Kimura, Takeo; and Takahashi, Shigeru, to Teijin Limited. Process for jet dyeing fibrous articles containing polyester-type synthetic fibers. 3,966,406, Cl. 8-179.000.

Nard Institute: *See—*
Ariyoshi, Junji; and Kariya, Noboru, 3,966,485.

National Can Corporation: *See—*
Levinson, Arthur A.; and Basa, Kenneth B., 3,966,977.

National Gypsum Company: *See—*
Schneller, Joseph W.; Bennett, Duane C.; and Matiacio, George P., 3,967,016.

National Machinery Company, The: *See—*
Kline, Gaylen O., 3,965,718.

National Research Development Corporation: *See—*
Bagg, Greville Euan Gordon; and Cracknell, Robert Ian, 3,965,722.
Freeman, Michael Alexander Reykers; Kempson, Geoffrey Edward; and Tuke, Michael Anthony, 3,965,489.
May, Edwin Richard Wells, 3,966,885.

NcNeil Laboratories, Incorporated: *See—*
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NCR Corporation: *See—*
Brown, George T., Jr., 3,966,314.
Dobias, Joseph J., 3,967,061.
Dobias, Joseph J., 3,967,062.

Nebel, Hans-Joachim, to BASF Aktiengesellschaft. Process for the manufacture of basic chrome tanning agents soluble in coldwater. 3,966,402, Cl. 8-94.270.

Neeb, Karl-Heinz; Schweighofer, Werner; and Weisse, Hans-Jorg, to Siemens Aktiengesellschaft. Method for preparing test specimens for analysis. 3,966,852, Cl. 264-.500.

Nelson, Clifford H. Home fireplace heating. 3,965,886, Cl. 126-121.000.

Nelson, Daryl A., to Raymond Lee Organization, Inc., The, a part interest. Lock for coats and other sleeved garments. 3,966,100, Cl. 223-92.000.

Nelson, James P.; and Steitz, Alfred, Jr., deceased (by Steitz, Margaret Marie, executrix), to Standard Oil Company. Poly(tetramethylene dibro moterephthalate). 3,966,682, Cl. 260-75.00H.

Nelson, Norman A., to Upjohn Company, The. 5-Oxa-11-deoxyphenyl- and phenoxy-substituted prostaglandin F_1 analogs. 3,966,795, Cl. 260-473.00A.

Nelson, Peter H.; and Untch, Karl G., to Syntex (U.S.A.) Inc. 2-Substituted-5-oxo-5H-dibenzo-[A,D]cycloheptenes, the esters and ethers thereof, having pharmaceutical activity, and methods and compositions for the use thereof. 3,966,820, Cl. 260-590.0FB.

Nelson, Richard B.: *See—*
Lien, Erling L.; Miram, George V.; and Nelson, Richard B., 3,967,150.

Nemecek, Borivoj; and Lipman, Jean M. Fasteners. 3,966,339, Cl. 403-292.000.

Nepote, Alain: *See—*
Coquelet, Andre; and Nepote, Alain, 3,966,140.

Nessel, Jiri M., to Richards, Victor. Single speed frictional drive unit with magnetic biasing means. 3,965,762, Cl. 74-206.000.

Neukom, Chester G.: *See—*
Anderson, Joseph A.; Neukom, Chester G.; and Kopecky, Ivyl, 3,966,128.

Neumaier, Hubert: *See—*
Vogt, Wilhelm; Neumaier, Hubert; Schallus, Erich; and Peantek, Gunter, 3,966,803.

Neuman, Richard F., to Eaton Corporation. Sequenced orifice fluid supply for occupant restraint system. 3,966,228, Cl. 280-737.000.

Newberry, John T., to Monarch Marking Systems, Inc. Rewind apparatus. 3,966,136, Cl. 242-67.10R.

Newell, George F., to Westinghouse Electric Corporation. Predistortion of NRZ recording current for video recordings. 3,967,317, Cl. 360-55.000.

Newingham, Thomas D.: *See—*
Duling, Irl N.; Gates, David S.; Glazier, Frederick P.; Moore, Robert E.; and Newingham, Thomas D., 3,966,624.

Newman, Irvin, to Fine, Ira W. Insulated glass panel. 3,965,638, Cl. 52-616.000.

Newstead, Charles, to Girling Limited. Hydraulically operated disc brakes for vehicles. 3,966,025, Cl. 188-72.500.

Ngo, Peter Dinh-Tuan, to Bell Telephone Laboratories, Incorporated. Light pen detection for plasma panels using specially timed scanning address pulses. 3,967,267, Cl. 340-324.00M.

Nicholls, Bryan Frederick, to Mettoy Company Limited, The. Check valve assembly. 3,965,930, Cl. 137-525.000.

Nichols, Gordon E., to Winthrop-Atkins Co., Inc. Desk calendar with easel. 3,966,161, Cl. 248-459.000.

Nicholson, Jerry W. Apparatus for washing stack gases. 3,966,438, Cl. 55-238.000.

Nickel, Horst: *See—*
Bleck, Wolf-Eckhard; Nickel, Horst; and Schundehutte, Karl-Heinz, 3,966,703.

Nicol, John, to Teledyne, Inc. Bicycle frame. 3,966,230, Cl. 280-281.00R.

Nicolet, Rene: *See—*
Gutmann, Walter; and Nicolet, Rene, 3,966,846.

Nicoletti, Emilio. Drive line coupling device with substantially homokinetic features. 3,965,700, Cl. 64-18.000.

Nielsen, Helmar. Picture frame. 3,965,601, Cl. 40-155.000.

Nifco Inc.: *See—*
Makihara, Chiharu; and Yoda, Tohru, 3,967,050.

Nihon Seikan Kabushiki Kaisha: *See—*
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Kawamata, Kiyoshi, 3,966,081.

Nihon Spindle Seizo Kabushiki Kaisha: *See—*
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Nikken Chemicals Co., Ltd.: *See—*
Tomioka, Tatsuo; Hoshide, Yasuo; Ogawa, Hirosi; and Suzuki, Kenichi, 3,966,720.

Nilsen, David N.: *See—*
Posel, John G.; Williams, Gregory P.; and Nilsen, David N., 3,966,462.

Nilson, Hans Erik, to Infrarodteknik AB. Device for reflecting radiant energy. 3,966,308, Cl. 350-293.000.

Ninane, Leon; and Kegelart, Willy, to Solvay & Cie. Coated alkali metal chlorite particles. 3,967,039, Cl. 428-403.000.

Ninet, Leon: *See—*
Mancy, Denise; Ninet, Leon; and Preud'homme, Jean, 3,966,557.

Nippon Asbestos Company, Ltd.: *See—*
Otouma, Takashi; and Nakamura, Michio, 3,967,043.

Nippon Concrete Industries, Co., Ltd.: *See—*
Fukushima, Yoshikiyo; Momota, Kenzo; Shirahata, Hideaki; and Sakanai, Noriyuki, 3,966,375.

Nippon Electric Company, Ltd.: *See—*
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Tagashira, Yoshimi; Atobe, Masaaki; and Yamamoto, Kazuhiro, 3,967,220.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Kayaku Kabushiki Kaisha: *See—*
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Takenaka, Shigeo; Shimizu, Hitoshi; and Yamamoto, Kenichiro, 3,966,823.

Nippon Kokan Kabushiki Kaisha: *See—*
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Nippon Mining Co., Ltd.: *See—*
Okudaira, Shigenori; Iwakami, Michiaki; and Iriye, Takefumi, 3,966,892.

Nippon Oils and Fats Company Limited: *See—*
Sakai, Hiroshi; Takeuchi, Fumio; and Hanake, Tsutomu, 3,966,516.
Tanizaki, Yoshiharu; Kawaguchi, Hiroshi; and Minagawa, Kenichiro, 3,966,625

Nippon Pelnox Corporation: *See—*
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Nippon Sheet Glass Co., Ltd: *See—*
Sakata, Nobuhiro; and Suzuki, Toshihiro, 3,966,665.

Nippon Shinyaku Co., Ltd.: *See—*
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Murai, Hiromu; Ohata, Katsuya; Aoyagi, Yoshiaki; Ueda, Fusao; Kitano, Masahiko; Takata, Satoshi; and Tada, Shinichi, 3,966,728.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
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Nippon Soken, Inc.: *See—*
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Nippondenso Co., Ltd.: *See—*
Kamigaito, Osami; Doi, Haruo; Masaki, Hideyuki; Kandori, Toshio; Oki, Masami; and Nakamura, Yasuo, 3,967,230.

Nischk, Gunther: *See—*
Christoph, Geert; Radlmann, Eduard; Nischk, Gunther; Bruns, Ludwig; and Schnuchel, Gunther, 3,966,835.

Nishida, Kazunori: *See—*
Hada, Hiroshi; Hirayama, Tsutomu; and Nishida, Kazunori, 3,967,157.

Nishida, Takeshi; Shiromaru, Isao; and Teshima, Tsutomu, to Kanebo, Ltd. Method for producing fibril fibrous structures. 3,966,865, Cl. 264-147.000.

Nishikawa, Takeo: *See—*
Shimada, Keizo; Nishikawa, Takeo; Harada, Toshiaki; and Nagahama, Shizuo, 3,966,830.

Nishimura, Katushi: *See—*
Godai, Tomokazu; Sugiyama, Toboru; and Nishimura, Katushi, 3,966,424.

Nishiyama, Shigeyuki; Tsurumi, Kotaro; and Yoshimura, Katsuaki, to Nihon Spindle Seizo Kabushiki Kaisha. Apparatus for processing yarn end of cops supplied to the winder. 3,966,141, Cl. 242-35.50A.

Nite, Rebecca F., to Barnes-Hind Pharmaceuticals, Inc. Stabilized catechol amine solutions. 3,966,905, Cl. 424-80.000.

Nitsch, Rainer: *See—*
Riedl, Rudi; Jungnickel, Regina; Nitsch, Rainer; Lein, Werner; Vetter, Lothar; Schone, Helmut; Weisbach, Gunter; Johne, Hans; Schott, Alfred; Forster, Karl-Heinz; and Johne, Albrecht, 3,966,197.

Nitta, Minoru: *See—*
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Nittel, Herman: *See—*
Redmer, Wilbert; Rolin, Kenneth; and Nittel, Herman, 3,966,038.

Noakes, Michael Lesney; Caesar, Wilfred George; Holland, William Henry; and Hancock, Norman Herbert, to United Kingdom Atomic Energy Authority. Fabricating bodies. 3,966,646, Cl. 252-477.00R.

Noellert, Larry L., to Willey Sign Company. Advertising sign structure. 3,965,597, Cl. 40-130.00D.

Noetzel, Siegfried; Jastrow, Horst; and Fischer, Edgar, to Hoechst Aktiengesellschaft. Bromine-containing cyclic phosphonic acid esters. 3,966,849, Cl. 260-937.000.

Nohendorf, Hans: *See—*
Weber, Karl-Heinz; and Nohendorf, Hans, 3,967,180.

Nomura, Kousi; Kawazu, Satoru; Hirose, Yoshihiko; Inoue, Isao; Watari, Yoshihiko; and Kijima, Koichi, to Mitaubishi Denki Kabushiki Kaisha. Process of producing semiconductor devices. 3,966,501, Cl. 148-1.500.

Nomura, Masahide, to Hitachi, Ltd. Device for controlling speed of turbine. 3,965,684, Cl. 60-660.000.

Nonaka, Yasuhiko, to Hitachi, Ltd. Method of manufacturing targets of pickup tubes. 3,966,512, Cl. 148-174.000.

Nonnenmacher, Frank: *See—*
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Nordsiek, Karl-Heinz: *See—*
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Nordson Corporation: *See—*
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Northern Illinois Gas Company: *See—*
Batz, James E., 3,967,202.

Northup, John D. Venting bottle closure. 3,966,071, Cl. 215-260.000.

Norton, Dale H., to Besser, Roy. Locking top and bottom container. 3,966,085, Cl. 220-327.000.

Nosco Plastics, Inc.: *See—*
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Notenboom, Antonius Paulus: *See—*
Deylius, Hendrik Gerardus; Lammers, Jan Frederik; and Notenboom, Antonius Paulus, 3,967,123.

Novex RT: *See—*
Vass, Karoly; Karpati, Gyorgy; Szechenyi-Marton, Eva; and Simek, Ferenc, 3,966,554.

Novikov, Sergei Sergeevich; Khmelnitsky, Lenor Ivanovich; Lebedev, Oleg Vasilievich; Epishina, Lia Vladimirovna; Suvorova, Ljudmila Ivanovna; Lapshina, Lidia Vasilievna; Krylov, Valery Dmitrievich; Zaikonnikova, Irina Vitalievna; Zimakova, Irina Evgenievna; Chudnovsky, Vladimir Sergeevich; Babichev, Viktor Andreevich; and Avdonina, Nina Alexandrovna. Tetra-N-alkyl derivatives of bicyclic ureas and method of their production. 3,966,742, Cl. 260-256.40F.

Nuclear Associates, Inc.: *See—*
Smulewicz, Jan J., 3,967,128.

Nunes, Emmanuel; and Vervin, Jacques, to Saint-Gobain Industries. Inspection of glass articles. 3,966,048, Cl. 209-82.000.

Nunning, Walter J.: *See—*
Ballman, Richard L.; Lea, Kenneth R.; Nunning, Walter J.; and Southern, John H., 3,966,866.

Nurita, Joji: *See—*
Konomi, Tsohiaki; Nurita, Joji; and Tanazawa, Yasushi, 3,965,873.

Nussbaum, Herbert H., to Miller Hydro Company. High speed case packing machine. 3,965,650, Cl. 53-166.000.

Oberg, Gordon D. Method of compressing scrap metal. 3,965,812, Cl. 100-39.000.

Oborn, Robert Edward, to Procter & Gamble Company, The. Angel food cake mix. 3,966,991, Cl. 426-555.000.

O'Brien, Patrick William, to Compoflex Company Limited. Apparatus for making corrugated flexible tubing. 3,966,379, Cl. 425-327.000.

Oce-Andeno B.V.: *See—*
Hendrickx, Andreas J. J.; and van Duyl, Willem H., 3,966,741.

Ocean Systems, Inc.: *See—*
McKenna, Henry Alvin, 3,966,170.

Ochiai, Takashi: *See—*
Inoue, Ichizo; Oine, Toyonari; Yamada, Yoshihisa; Tani, Junichi; Ishida, Ryuichi; and Ochiai, Takashi, 3,966,731.

Oda, Kouzou; and Miki, Hidefumi. Method for the production of fiber-reinforced resin compounds. 3,967,004, Cl. 427-196.000.

Oddy, Keith Mason. Letterpress printing machine. 3,966,534, Cl. 156-384.000.

Oesterlein, Fritz; and Riat, Henri, to Ciba-Geigy Corporation. Disulfo naphthalene containing fiber-reactive tetrazo dyes. 3,966,705, Cl. 260-153.000.

Offermanns, Heribert: *See—*
Asinger, Friedrich; Offermanns, Heribert; Gluzek, Karl-Heinz; and vonBebenburg, Walter, 3,966,752.

Ogawa, Akira: *See—*
Hinata, Masanao; Takei, Haruo; Ikeda, Tadashi; Ogawa, Akira; Sato, Akira; and Iwamoto, Atsuo, 3,966,477.

Ogawa, Hirosi: *See—*
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Ogawa, Masanobu: *See—*
Takenaka, Shigeo; Shimizu, Hitoshi; and Ogawa, Masanobu, 3,966,802.

Ogawa, Takuzo: *See—*
Yatsuo, Tsutomu; Kamei, Tatsuya; Ogawa, Takuzo; and Tanaka, Tomoyuki, 3,967,308.

Ohara, Naoki: *See—*
Kuromitsu, Hiromu; and Ohara, Naoki, 3,966,605.

Ohata, Katsuya: *See—*
Murai, Hiromu; Ohata, Katsuya; Aoyagi, Yoshiaki; Ueda, Fusao; Kitano, Masahiko; Takata, Satoshi; and Tada, Shinichi, 3,966,728.

Ohbayashi-Gumi, Ltd.: *See—*
Saito, Jiro; Kimura, Kaoru; Kusuhara, Hiroshi; and Nakaguma, Kazuyoshi, 3,965,686.

Ohi, Akira: *See—*
Sonoyama, Yuzo; Ohi, Akira; and Hozumi, Yukio, 3,966,677.

Ohio State University, The: *See—*
Young, Jonathan D.; and Caldecott, Ross, 3,967,282.

Ohkawa, Masaaki; and Sawaguri, Yasuyoshi, to Sumitomo Chemical Company, Limited. Treatment of aqueous waste solution. 3,966,594, Cl. 210-22.00R.

Ohloff, Gunther: *See—*
Schulte-Elte, Karl-Heinrich; Joyeux, Michel; and Ohloff, Gunther, 3,966,819.

Ohmae, Tadayuki: *See—*
Kudo, Ken-Ichi; Ohmae, Tadayuki; Toyoshima, Yoshiki; and Hara, Sumio, 3,966,821.

Ohminato, Mitsuru: *See—*
Sanchez, Fred M.; Shirai, Yukio; Sakakibara, Toshiyuki; and Ohminato, Mitsuru, 3,965,556.

Ohtake, Katsumasa: *See—*
Sato, Katsunobu; Sueda, Yoshihisa; Izutsutani, Yoshiro; Imada, Kunihiko; and Ohtake, Katsumasa, 3,966,399.

Ohyama, Isao: *See—*
Hayashi, Masaki; Kori, Seiji; Ohyama, Isao; and Endo, Hirofumi, 3,966,792.

Oi, Shigeo. Heating apparatus with heat medium vapor. 3,967,093, Cl. 219-388.000.

Oine, Toyonari: *See—*
Inoue, Ichizo; Oine, Toyonari; Yamada, Yoshihisa; Tani, Junichi; Ishida, Ryuichi; and Ochiai, Takashi, 3,966,731.

Oishi, Tadashi; Kameda, Nobuyuki; Kato, Toshiro; Fujinami, Akira; Ozaki, Toshiaki; and Itooka, Eiyashi, to Sumitomo Chemical Company, Limited. N-substituted aminonitrile derivatives. 3,966,789, Cl. 260-465.400.

Okamoto, Shinzi: *See—*
Mattori, Hiroaki; Mizuta, Takemi; and Okamoto, Shinzi, 3,966,264.

Okamoto, Takehiko: *See—*
Fukui, Masahiro; Hayashi, Shigeru; Okamoto, Takehiko; Koga, Isao; and Inoi, Takeshi, 3,966,822.

Okamoto, Taneji; Fujie, Kuniyoshi; and Kondo, Sadao, to Takeda Chemical Industries, Ltd. Composition for poultry and livestock. 3,966,922, Cl. 424-227.000.

Okamura, Isao: *See—*
Omori, Akira; Okamura, Isao; Imoto, Tadasi; and Katoh, Takayuki, 3,966,597.

Okaniwa, Hiroshi: *See—*
Sobajima, Shigenobu; Okaniwa, Hiroshi; Chiba, Kiyoshi; and Takagi, Norio, 3,967,285.

Okano, Ryoichi; Bunda, Tsuchio; Mizusawa, Shinichiro; and Morita, Akiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tsuchiya. Exhaust gas purifier for internal combustion engine. 3,966,443, Cl. 55-337.000.

Okano, Takeshi: *See—*
Kurata, Tokuzo; Okano, Takeshi; Tamaru, Akio; Kato, Yozo; and Nagashima, Saburo, 3,966,810.

Okazima, Yoshiaki: *See—*
Mukushi, Toshimi; Izumi, Kenkichi; Takahashi, Sankichi; Okazima, Yoshiaki; Sawa, Toshio; and Komai, Mithumasa, 3,966,562.

Oki Electric Industry Company, Ltd.: *See—*
Watanabe, Akinori; Tanoshima, Katsuhide; Ando, Takao; Tohama, Akira; and Nagano, Akio, 3,967,143.

Oki, Masami: *See—*
Kamigaito, Osami; Doi, Haruo; Masaki, Hideyuki; Kandori, Toshio; Oki, Masami; and Nakamura, Yasuo, 3,967,230.

Okudaira, Sadao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Large aperture super wide angle lens. 3,966,306, Cl. 350-214.000.

Okudaira, Shigenori; Iwakami, Michiaki; and Iriye, Takefumi, to Nippon Mining Co., Ltd. Process for producing titanium dioxide. 3,966,892, Cl. 423-613.000.

Okuno, Yoshitoshi; Itaya, Nobushige; and Mizutani, Toshio, to Sumitomo Chemical Company, Limited. Insecticidal composition containing cyclopropane-carboxylate. 3,966,963, Cl. 424-305.000.

Okura, Takao: *See—*
Sakurai, Yoshitoshi; Okura, Takao; and Tanaka, Miniru, 3,965,881.

Olashaw, William Francis; and Wilbur, Roger Thomas, to General Electric Company. Switchboard apparatus having control wiring passageways. 3,967,165, Cl. 317-120.000.

Oldshue, James Y., to General Signal Corporation. Multi-stage bleaching of pulp using successively lower power levels. 3,966,542, Cl. 162-57.000.

Olin Corporation: *See—*
Crown, Marlyn Dale; and Finley, Carl Eugene, 3,966,097.
Etheredge, Cortez, Jr., 3,965,760.
Marlow, Darrell W., 3,966,225.
Schaffling, Otto G., 3,965,676.

Olinkraft, Inc.: *See—*
Sherman, Earle Conrad, 3,965,643.

Oliver, Stuart M.; Proud, Ralph A., Jr.; and Parsons, Sanford J., to Delphian Foundation, The; and Q^2 Corporation, a part interest to each. Flame detection system. 3,967,255, Cl. 340-227.00R.

Olrik, Henrik Gerner. Device for converting rotary motion to axial motion and a method of applying the device for truing, polishing or calibrating a body of rotation. 3,966,280, Cl. 308-176.000.

Olsen, Lee J.: *See—*
Jentzsch, David P.; Anderson, Hyrum T.; and Olsen, Lee J., 3,965,967.

Olsson, Carl Anders, to Alfa-Laval AB. Device for delivering feed portions to different places. 3,965,867, Cl. 119-52.0AF.

Olstowski, Franciszek, to Dow Chemical Company, The. Solid, rapid-setting, rigid polyurethanes. 3,966,662, Cl. 260-30.60R.

Olstowski, Franciszek, to Dow Chemical Company, The. Solid, rapid-setting, rigid polyurethanes. 3,966,664, Cl. 260-31.40R.

Olympus Optical Co., Ltd.: *See—*
Tojyo, Tsutomu, 3,966,307.

Omi Industrial Company, Limited: *See—*
Omi, Toshimitsu; and Omi, Takashi, 3,965,774.

Omi, Takashi: *See—*
Omi, Toshimitsu; and Omi, Takashi, 3,965,774.

Omi, Toshimitsu; and Omi, Takashi, to Omi Industrial Company, Limited. Reduction gear apparatus. 3,965,774, Cl. 74-805.000.

Omori, Akira; Okamura, Isao; Imoto, Tadasi; and Katoh, Takayuki, to Teijin Limited. Oil or organic solvent-absorbent. 3,966,597, Cl. 210-39.000.

Omron Tateisi Electronics Co.: *See—*
Muramatu, Akira; and Kawata, Kiyoshi, 3,967,245.
Yamamoto, Mititaka, 3,966,303.

Oneida Electronics: *See—*
Anglin, Russell E., 3,967,314.

O'Neill, Eoin P.: *See—*
Craig, John W. T.; O'Neill, Eoin P.; and Kearns, Dale L., 3,966,431.

O'Neill, Eugene T.; and Kibbel, William H., Jr., to FMC Corporation. Animal waste odor treatment. 3,966,450, Cl. 71-15.000.

O'Neill, John Francis: *See—*
Dimmick, James Owen; Lewis, Theras Gordon; O'Neill, John Francis; and Fabiano, Lucian Philip, Jr., 3,967,072.

O'Neill, Wilbur J.: *See—*
Colston, John R.; and O'Neill, Wilbur J., 3,965,892.

Ono, Kimio: *See—*
Torii, Kenji; Ozawa, Tatsuya; Ono, Kimio; Iwabe, Koichi; and Horikawa, Hiroumi, 3,966,903.

Ono Pharmaceutical Co., Ltd.: *See—*
Hayashi, Masaki; Kori, Seiji; Ohyama, Isao; and Endo, Hirofumi, 3,966,792.

Ono, Takayuki: *See—*
Yamaguchi, Tadashi; Ono, Takayuki; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, 3,967,006.

Opfermann, Johannes: *See—*
Feltz, Adalbert; Opfermann, Johannes; Voigt, Bernd; and Seliger, Walter, 3,966,470.

Opti-Holding AG: *See—*
Frohlich, Alfons; and Cappel, Marie-Luise, 3,965,833.

Orain, Michel, to Societe Anonyme: Glaenzer Spicer. Constant velocity universal joints. 3,965,701, Cl. 64-21.000.

Ordway, James F.: *See—*
Bailey, Edward A.; and Ordway, James F., 3,966,341.

Original Hanau Quarzlampen GmbH: *See—*
Junginger, Klaus; and Sturm, Walter, 3,967,107.

Origo, Incorporated: *See—*
Lundquist, Ingemar H., 3,965,897.

Orszagos Erc- es Asvanybanyak: *See—*
Csatar, Kalman; and Soha, Istvan, 3,966,641.

Orzel, Edward S.; and Thrush, Richard G., to Weatherhead Company, The. Inertia load sensing brake valve. 3,966,268, Cl. 303-24.00F.

Osako, Naoto; Kozima, Katsumi; Shimizu, Hiroshi; and Kimura, Kazumi, to Mitsubishi Chemical Industries Ltd. Process for preparing prilled porous ammonium nitrate. 3,966,853, Cl. 264-13.000.

Osborne, Neal Frederick: *See—*
Brain, Edward George; and Osborne, Neal Frederick, 3,966,718.

Oshima, Shigeru, to Fuji Photo Film Co., Ltd. Miniature camera for roll film. 3,967,300, Cl. 354-288.000.

Osiadacz, William J.; and Nagy, Alexander J., to Baxter Laboratories, Inc. Automated meat tenderization system. 3,965,536, Cl. 17-25.000.

Osman, Mohamed; and Greuner, Bernd, to Gebrueder Heller. Rotating cutter tool. 3,966,349, Cl. 408-204.000.

Osterfield, John Richard; and Pragnell, Robert George, to Pirelli General Cable Works Limited. Communication cables. 3,966,299, Cl. 350-96.00C.

Osterlund, Paul Alan: *See—*
Long, James Michael; and Osterlund, Paul Alan, 3,967,047.

Ostermeier, Kurt W.: *See—*
Mitchell, Kenneth J.; and Ostermeier, Kurt W., 3,966,519.

Ostrowski, Arthur E., to Allied Tube & Conduit Corporation. Production of polymer-coated steel tubing. 3,965,551, Cl. 29-33.00D.

O'Sullivan, Thomas Denis, to Bell Telephone Laboratories, Incorporated. Impregnation of electrodes for nickel cadmium batteries. 3,966,494, Cl. 136-24.000.

Otley, Stephen Reverdy: *See—*
Dexter, Edward; and Otley, Stephen Reverdy, 3,966,983.

Otomo, Kanji: *See—*
Uemura, Masaru; Kuroki, Hitoshi; Echida, Nobuhiro; Kosaka, Yujiro; and Otomo, Kanji, 3,967,020.

Otouma, Takashi; and Nakamura, Michio, to Nippon Asbestos Company, Ltd. Asbestos articles having dustproof properties. 3,967,043, Cl. 428-443.000.

Ott, Hans; and Suess, Rudolf, to Sandoz Ltd. Treatment of thrombosis and the inhibition of blood platelet aggregation. 3,966,938, Cl. 424-258.000.

Ott, Karl-Heinz: *See—*
Becker, Theo; Hilscher, Eduard; and Ott, Karl-Heinz, 3,965,953.

Ottertun, Harald Daniel: *See—*
Reinhardt, Hans; and Ottertun, Harald Daniel, 3,966,569.

Otto, George W., Jr., to American Radiologic Systems Inc. X-ray apparatus having table with improved top. 3,967,126, Cl. 250-439.000.

Otto Sick K.G., Firma: *See—*
Kurzweil, Lubor, 3,966,039.

Ottobre, Louis G.: *See—*
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Outboard Marine Corporation: *See—*
Jespersen, Herbert A., 3,965,657.
Rose, Edgar, 3,966,004.

Overton, Harold C., to Republic Steel Corporation. Bearing chocking assembly for mill rolls. 3,966,282, Cl. 308-207.00R.

Ovshinsky, Stanford R.: *See—*
Wacks, Harvey H.; Klose, Peter H.; Ovshinsky, Stanford R.; and Hallman, Robert W., 3,966,317.

Owatonna Manufacturing Company, Inc.: *See—*
Kanengieter, Glenn G.; and Barry, Gerald E., 3,965,660.

Owen, Hartley; and Venuto, Paul B., to Mobil Oil Corporation. Method for upgrading heavy petroleum type stocks. 3,966,586, Cl. 208-120.000.

Owens-Corning Fiberglas Corporation: *See—*
Froberg, Magnus L.; and Maddux, John F., 3,967,046.
Gelin, Robert J.; and Bartlett, James E., 3,966,132.
Gelin, Robert J., 3,966,133.
Marzocchi, Alfred; Jannarelli, Albert E.; and Garrett, David W., 3,967,037.
Terpak, Anthony, 3,966,139.

Oxe, Josef; and Keller, Rudolf, to Ciba-Geigy Corporation. Process for the permanent finishing of fiber materials. 3,966,659, Cl. 260-29.6MN.

Oxy Metal Industries (Intra) Inc.: *See—*
Bachle, Wilfred H.; Peck, John V.; Stantial, Thomas D.; and Williams, Richard H., 3,966,364.

OY Tampella AB Mechanical Workshops: *See—*
Heikkila, Viekko; Hakkinen, Leo; Strom, Rolf; Uusitalo, Leo; and Mellin, Juha, 3,966,019.

Ozaki, Toshiaki: *See—*
Oishi, Tadashi; Kameda, Nobuyuki; Kato, Toshiro; Fujinami, Akira; Ozaki, Toshiaki; and Itooka, Eiyashi, 3,966,789.

Ozawa, Tatsuya: *See—*
Torii, Kenji; Ozawa, Tatsuya; Ono, Kimio; Iwabe, Koichi; and Horikawa, Hiroumi, 3,966,903.

Ozone Incorporated: *See—*
Slipiec, Romuald E.; and Schultz, Ronald A., 3,967,131.

P.I.D. Patents and Inventions Development Limited: *See—*
Doriel, Joseph, 3,966,232.

P. R. Mallory & Co., Inc.: *See—*
Klein, Gerhart P.; and Kallianidis, Milton, 3,967,000.

Pace, Gerald F.; Stauter, John C.; Armstrong, Calvin N.; and Harris, Gary R., to Continental Oil Company. Electrolysis process and apparatus. 3,966,567, Cl. 204-105.00R.

Pachter, Irwin J.; and Gordon, Maxwell, to Bristol-Myers Company. Analgetic compositions. 3,966,940, Cl. 424-260.000.

Pacific Adhesives, Inc.: *See—*
Cone, Charles N.; and Steinberg, Julius M., 3,965,860.

Packer, Mervyn Brian: *See—*
Taylor, Robert Ernest; Packer, Mervyn Brian; and Parsons, David, 3,966,265.

Pagano, Joseph F.; and Schoengold, Ronald J., to SmithKline Corporation. Device for making a culture of micro-organisms. 3,966,552, Cl. 195-139.000.

Page, Armond J.: *See—*
Gonzales, Joseph M.; and Page, Armond J., 3,966,072.

Page, Geoffrey A.; Grammatica, Steven J.; and Ewing, Joan R., to Xerox Corporation. Photoelectrophoretic imaging process using dark charge injecting agent on blocking electrode. 3,966,466, Cl. 96-1.200.

Pammer, Manfred: *See—*
Fastner, Thorwald; and Pammer, Manfred, 3,965,964.

Panduit Corporation: *See—*
Caveney, Jack E.; and Moody, Roy A., 3,965,538.

Panoch, Hans Joachim: *See—*
Feldmann, Rainer; Kriesten, Wolfgang; Muller, Karl Adolf; Panoch, Hans Joachim; and Scholten, Heinz, 3,966,838.

Papantoniou, Christos; and Grognet, Jean-Claude, to L'Oreal. Hair lacquer or hair setting composition containing a tetrapolymer. 3,966,403, Cl. 8-127.510.

Papantoniou, Christos; and Grognet, Jean-Claude, to L'Oreal. Hair laquer or hair setting composition containing a terpolymer. 3,966,404, Cl. 8-127.510.

Papaux, Jean-Claude: *See—*
Portmann, Albert; and Papaux, Jean-Claude, 3,967,081.

Papesh, Edward F.: *See—*
Papesh, Edward G.; and Papesh, Edward F., 3,966,861.

Papesh, Edward G.; and Papesh, Edward F., to Pierson Industries, Inc. Composite tubular film process and apparatus. 3,966,861, Cl. 264-95.000.

Paradiso, Erasmus J. Wave energy machine. 3,965,679, Cl. 60-398.000.

Paragamian, Vasken; and Taylor, Russell J., Jr., to NcNeil Laboratories, Incorporated. Inhibition of gastric acid secretion with 1-alkyl-2-R-perimidines. 3,966,933, Cl. 424-251.000.

Paragamian, Vasken; and Taylor, Russell J., Jr., to McNeil Laboratories, Incorporated. Inhibition of ulcers with 2(3H)-perimidylidene-2-propanone. 3,966,935, Cl. 424-251.000.

Paramount Packaging Corporation: *See—*
Reubens, Clarence Edmond; Campbell, Sterrett Paxton; and Marston, Lloyd Everett, 3,965,654.

Parent, Richard A., to Xerox Corporation. Transferring toner to an hydrocarbon sheet. 3,966,467, Cl. 96-1.400.

Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, to Anumin Pty. Limited. Method of producing solutions containing cuprous ions. 3,966,890, Cl. 423-512.00A.

Parker-Hannifin Corporation: *See—*
Furgalus, Keith A.; and Simmons, Harold C., 3,966,120.
Washkewicz, Donald E.; and Busdiecker, Wayne S., 3,966,238.

Parker, Robert, to RPR, Inc. Digital thermometer and method of manufacture. 3,965,742, Cl. 73-356.000.

Parkinson, David B., to Gould Inc. Machine for making expanded metal. 3,965,550, Cl. 29-6.200.

Parkinson, Lindley A.: *See—*
Johnson, Leland L.; and Parkinson, Lindley A., 3,966,078.

Parmann, Gunnar, to Rieber & Son A/S. Method and apparatus for bending thermoplastic pipes. 3,965,715, Cl. 72-342.000.

Parsons, David: *See—*
Taylor, Robert Ernest; Packer, Mervyn Brian; and Parsons, David, 3,966,265.

Parsons, Sanford J.: *See—*
Oliver, Stuart M.; Proud, Ralph A., Jr.; and Parsons, Sanford J., 3,967,255.

Pascal, Yves Robert Alain: *See—*
Giudicelli, Don Pierre Rene Lucien; Najer, Henry; Iliesco-Branceni, Bogdan; and Pascal, Yves Robert Alain, 3,966,745.

Pascale, John V.: *See—*
Pittet, Alan O.; Pascale, John V.; and Hruza, Denis E., 3,966,989.

Paskerian, Wayne H., to M. W. Carr & Co., Inc. Frame hanger. 3,965,600, Cl. 40-152.100.

Pass, Roger D. String system for a game racket. 3,966,207, Cl. 273-73.00D.

Patentverwertungs - und Finanzierungsgesellschaft, SERANIA: *See—*
Schmid, August, 3,966,206.

Patron, Luigi: *See—*
Melacini, Paolo; Patron, Luigi; Doria, Giorgio; and Tedesco, Raffaele, 3,966,666.

Patterson, Frank: *See—*
Baker, Bill; and Patterson, Frank, 3,966,135.

Patterson, William R., to General Electric Company. Thermal actuated valve for clearance control. 3,966,354, Cl. 415-116.000.

Patton, John T., Jr.; Pizzini, Louis C.; Demou, John G.; and Ramlow, Gerhard G., to BASF Wyandotte Corporation. Polyurethane foam composite. 3,966,521, Cl. 156-78.000.

Patuzzi, Alexander; Eysn, Manfred; and Moser, Peter, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Converter with a converter hood. 3,966,180, Cl. 266-158.000.

Patzke, Robert C., to Addressograph Multigraph Corporation. Duplicating machine exposure system. 3,966,321, Cl. 355-121.000.

Paulucci, Jeno F. Golf aid. 3,965,488, Cl. 2-161.00A.

Pausch, Josef; and Kwon, Sung Lim, to General Resource Corporation. Method for removing pollutants from a gaseous mixture. 3,966,878, Cl. 423-242.000.

Pavey, John S., to General Motors Corporation. Headlamp washer system. 3,965,522, Cl. 15-250.040.

Pawloski, Chester E., to Dow Chemical Company, The. Substituted 1,3-dioxepins. 3,966,768, Cl. 260-338.000.

Peantek, Gunter: *See—*
Vogt, Wilhelm; Neumaier, Hubert; Schallus, Erich; and Peantek, Gunter, 3,966,803.

Pearlman, Alan R., to ARP Instruments, Inc. Electronic musical instrument effects control. 3,965,789, Cl. 84-1.240.

Pearson, James R., to Bresan, Lawrence A.; and Pearson, James R., a part interest to each. Conduit apparatus. 3,965,629, Cl. 52-221.000.

Peck, John V.: *See—*
Bachle, Wilfred H.; Peck, John V.; Stantial, Thomas D.; and Williams, Richard H., 3,966,364.

Pegels, Abraham A.; and Wijffels, Joannes B., to Shell Oil Company. Apparatus and process for the catalytic treatment of hydrocarbons. 3,966,420, Cl. 23-288.00R.

Pelegrinelli, Raymond L.: *See—*
Sullivan, Thomas R.; Du, John W.; Pelegrinelli, Raymond L.; and Das, Suryya K., 3,966,667.

Pelosi, Stanford S., Jr., to Morton-Norwich Products, Inc. 5-(4-Chlorophenyl)-2-furyl ketones. 3,966,771, Cl. 260-347.800.

Penney, Gaylord W. Electrostatic dust filter. 3,966,435, Cl. 55-131.000.

Pennwalt Corporation: *See—*
Huber, Ludwig Konrad, 3,966,929.
King, James Ping; Simkin, Joseph; and Radice, Peter F., 3,966,486.

Penny, Samuel Lee, to Dresser Industries, Inc. Roller separator for bit bearings. 3,966,274, Cl. 308-8.200.

Penny, William Henry; and Spaeth, Edmund E., to American Hospital Supply Corporation. Suction catheter. 3,965,901, Cl. 128-276.000.

Perdue, Richard R., to W. R. Grace & Co. Skin package. 3,966,045, Cl. 206-443.000.

Peroxid-Chemie GmbH: *See—*
Edl, Wolfgang; Meister, Werner; and Seidl, Hans, 3,966,840.

Perr, Julius P., to Cummins Engine Company, Inc. Fuel injection system for diesel engines. 3,965,875, Cl. 123-139.0AY.

Perrault, Frederick; and Perrault, Raymond E. Cable hanger. 3,966,154, Cl. 248-62.000.

Perrault, Raymond E.: *See—*
Perrault, Frederick; and Perrault, Raymond E., 3,966,154.

Perrotti, Emilio: *See—*
Cipriani, Gioacchino; and Perrotti, Emilio, 3,966,782.

Perry, Eli; and Strazik, William F., to Monsanto Company. Process for the separation of diene from organic mixtures. 3,966,834, Cl. 260-681.50R.

Persson, Jan Edvard: *See—*
Hilding, Jonas Olof Anders; and Persson, Jan Edvard, 3,965,997.

Petchul, Richard K.: *See—*
Petchul, Sigvald L.; and Petchul, Richard K., 3,966,615.

Petchul, Sigvald L.; and Petchul, Richard K. Oil collection barge. 3,966,615, Cl. 210-242.00R.

Peter, Donald W.: *See—*
Boubel, Richard W.; Babler, David C.; and Peter, Donald W., 3,965,748.

Peter Paul Electronics Co., Inc.: *See—*
Allen, Walter E., 3,965,923.

Petersen, Robert E.; and Dietsche, Robert J., to Westinghouse Electric Corporation. Electric heating unit support assembly. 3,967,094, Cl. 219-532.000.

Petersen, Ross K. Heating and cooling system. 3,965,972, Cl. 165-45.000.

Peterson, Raymond T., Jr.; and Stevenson, Paul D., to General Motors Corporation. Torque converter and slipping clutch. 3,966,031, Cl. 192-3.300.

Peterson, William H., to Pullman Incorporated. Vehicle speed control device. 3,966,150, Cl. 246-182.00B.

Petigara, Ramesh B.: *See—*
Yale, Harry Louis; and Petigara, Ramesh B., 3,966,733.

Petrocci, Alfonso N.: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 3,966,904.

Petrolite Corporation: *See—*
Quinlan, Patrick M., 3,966,630.

Pfeifer, Josef; and Schnall, Gunther, to AGFA-Gevaert, A.G. Electrostatic copying machine with removable copying drum. 3,966,316, Cl. 355-3.00R.

Pfeifer, Josef: *See—*
Abbe, Gunter; Eppe, Rudolf; Ettelbruck, Rudiger; Pfeifer, Josef; and Schnall, Gunther, 3,966,194.

Pfiffner, Albert: *See—*
Chodnekar, Madhukar Subraya; Loeliger, Peter; Pfiffner, Albert; Schwieter, Ulrich; Suchy, Milos; and Zurfluh, Rene, 3,966,780.

Pfizer Inc.: *See—*
Barth, Wayne E., 3,966,719.
Cronin, Timothy H.; and Hess, Hans-Jurgen E., 3,966,936.
Jonas, David Andrew, 3,966,985.
McFarland, James W.; and Thomson, Colin, 3,966,710.
Mylari, Banavara L., 3,966,951.

Pfleiderer, Ernst: *See—*
Monsheimer, Rolf; and Pfleiderer, Ernst, 3,966,551.

Pfost, Karl, to Muller, Fritz. Arrangement for the attachment of a body to a support. 3,965,813, Cl. 100-99.000.

Pharmacia Diagnostics AB: *See—*
Sjoquist, John A.; and Sjodin, Arne V., 3,966,898.

Philadelphia Quartz Company: *See—*
Derolf, M. Robert; and Hertzenberg, Elliot P., 3,966,893.

Philippson, Rainer, to Schering Aktiengesellschaft. Process for the preparation of a Δ^4-3-keto steroid 17-propiolactone. 3,966,714, Cl. 260-239.570.

Phillips, Louis H.: *See—*
Brantingham, George L.; and Phillips, Louis H., 3,967,104.

Phillips Petroleum Company: *See—*
Campbell, Robert W., 3,966,688.
Chapman, Charles C., 3,966,417.
Frazier, Arthur E., 3,966,434.
Hitzman, Donald O., 3,965,985.
Hudson, Jimmie E.; and Dockery, Calvin D., 3,966,860.

Phipps, Charles M.; and Hayes, Douglas R., to United Technologies Corporation. Mold and process for casting high temperature alloys. 3,965,963, Cl. 164-60.000.

Pickles, Joseph, to Ferro Manufacturing Corporation. Programmed sequential operator. 3,965,618, Cl. 49-103.000.

Pictorial Productions, Inc.: *See—*
Weingrad, Saul W., 3,967,021.

Pierpoline, Mario F., to Westinghouse Electric Corporation. Steam turbine extraction system. 3,966,355, Cl. 415-144.000.

Pierre Fabre S.A.: *See—*
Serre, Hubert, 3,966,923.

Pierson Industries, Inc.: *See—*
Papesh, Edward G.; and Papesh, Edward F., 3,966,861.

Piesch, Steffen; and Engelhardt, Friedrich, to Cassella Farbwerke Mainkur Aktiengesellschaft. Sulfonyl compounds. 3,966,769, Cl. 260-340.500.

Piesch, Steffen: *See—*
Ribka, Joachim; Engelhardt, Friedrich; and Piesch, Steffen, 3,966,689.

Pike, Barry Graham: *See—*
Curry, Kenneth Vasey; Gamadia, Rustom Kooverji; and Pike, Barry Graham, 3,966,087.

Pike, Charles T.: *See—*
Itzkan, Irving; and Pike, Charles T., 3,967,211.

Pilgram, Kurt H. G., to Shell Oil Company. Herbicidal orthonitroanilines. 3,966,817, Cl. 260-578.000.

Pillsbury Company, The: *See—*
Henry, William F.; Templeman, Gareth J.; Gorman, Roger A.; and Pinaire, Lawrence, 3,966,973.

Pinaire, Lawrence: *See—*
Henry, William F.; Templeman, Gareth J.; Gorman, Roger A.; and Pinaire, Lawrence, 3,966,973.

Pinkesfeld, Mordehay. Indexing device. 3,965,775, Cl. 74-827.000.

Pinto, Martin: *See—*
Portas, Abelardo Antonio; and Pinto, Martin, 3,965,615.

Pippin, Reginald F., Jr. Directionally stable reaction-fluid-propelled carrier missile with fluid-sealed movable retention and release wall. 3,965,611, Cl. 46-74.00B.

Pirelli General Cable Works Limited: *See—*
Osterfield, John Richard; and Pragnell, Robert George, 3,966,299.

Pitney-Bowes, Inc.: *See—*
Lupkas, Raymond R.; and Schubert, Keith E., 3,965,815.
Storace, Anthony; and Sette, Paul R., 3,966,193.
Strobel, Harry, 3,966,191.

Pitt, William A.: *See—*
Bauerle, Richard D.; Pitt, William A.; and White, Mervyn A., 3,965,938.

Pittet, Alan O.; Pascale, John V.; and Hruza, Denis E., to International Flavors & Fragrances Inc. Flavoring methods and compositions. 3,966,989, Cl. 426-535.000.

Pittman, Gloucester R. Hand held garden implement. 3,965,990, Cl. 172-375.000.

Pizzini, Louis C.: *See—*
Patton, John T., Jr.; Pizzini, Louis C.; Demou, John G.; and Ramlow, Gerhard G., 3,966,521.

Plessey Incorporated: *See—*
Fraioli, Anthony V.; and DeRosa, John A., 3,966,463.

Plischke, Eugene W. Retractable blade guard. 3,965,787, Cl. 83-478.000.

Plitzkow, Howard G., to Humphrey Elevator and Truck Company. Braking apparatus for stopping a rotating shaft. 3,966,027, Cl. 188-182.000.

Plotnick, Richard J.: *See—*
Martz, Lyle F.; and Plotnick, Richard J., 3,965,675.

Plotnikov, Andrei Dmitrievich; Soloviev, Viktor Andreevich; Ter-Mateosiants, Tigran Ovanesovich; and Shpakov, Oleg Nikolaevich. Safety device for the drive of a closing member. 3,965,759, Cl. 74-89.140.

Plotz, Kurt; Breschar, Klaus; and Klein, Albert, to Hoechst Aktiengesellschaft. Bituminized roof sheet. 3,967,032, Cl. 428-300.000.

Plumat, Emile; Schottey, Jean; and Toussaint, Francois, to Glaverbel-Mecaniver. Production of colored glass bodies. 3,967,040, Cl. 428-410.000.

Podesva, Ctirad; and Scott, William T., to Delmar Chemicals Limited. Novel amino-indazole compounds. 3,966,761, Cl. 260-310.00C.

Podgurski, Harry H., to United States Steel Corporation. Method for reducing carbon deposits during box annealing. 3,966,509, Cl. 148-16.000.

Podiak, Richard S.: *See—*
Eaton, Carl J.; and Podiak, Richard S., 3,967,149.

Poeschel, Gordon Paul: *See—*
Levy, Stephen David; Poeschel, Gordon Paul; and Schrider, Michael Stanley, 3,966,919.

Polaroid Corporation: *See—*
Cote, Gerald J.; Lewis, John A., Jr.; and Skurski, James K., 3,967,302.
Delahunt, Robert M., 3,967,292.
Eloranta, Vaito K.; and Ruggles, Benjamin C., 3,967,297.
Fischer, Richard V.; and Kee, Richard C., 3,967,303.
Johnson, Bruce K.; and Van Allen, David E., 3,967,304.

Poletto, John Frank: *See—*
Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 3,966,773.

Poly-Optics, Inc.: *See—*
Elliott, James B., 3,966,166.

Pommer, Ernst-Heinrich: *See—*
Mangold, Dietrich; Zeeh, Bernd; and Pommer, Ernst-Heinrich, 3,966,750.

Pond, George R.: *See—*
Hindin, Saul G.; and Pond, George R., 3,966,391.
Hindin, Saul G.; and Pond, George R., 3,966,790.

Porch, Don E.; Manktelow, Paul W.; and Utz, James E. Collapsible shipping container. 3,966,285, Cl. 312-257.00R.

Portas, Abelardo Antonio; and Pinto, Martin. Method of preventing the formation of frost. 3,965,615, Cl. 47-2.000.

Portmann, Albert; and Papaux, Jean-Claude, to Sodeco-Saia S.A. Snap switch. 3,967,081, Cl. 200-67.0PK.

Posel, John G.; Williams, Gregory P.; and Nilsen, David N., to International Ore Technology, Inc. Recovery of nitric acid soluble transition metals from sulfur and iron containing ores of the same. 3,966,462, Cl. 75-101.0BE.

Posthuma, Albert E.; and Woodhouse, Robert C. Synthetic physiological mucus. 3,965,908, Cl. 128-303.00R.

Potoski, John R.: *See—*
Freed, Meier E.; and Potoski, John R., 3,966,815.

Potter, Ralph K., to Bell Telephone Laboratories, Incorporated. Secret telephony. 3,967,067, Cl. 179-1.50R.

Potts, Gordon O., to Sterling Drug Inc. Composition of a steroidal[2,3-d]-isoxazole and method of use thereof. 3,966,926, Cl. 424-241.000.

Pounds, Walter R., to KB-Denver, Inc. Keyboard switch assemblies having two foot support legs on dome-shaped contact member. 3,967,084, Cl. 200-275.000.

Power Control, Inc.: *See—*
Cottrell, Harold L.; and Mamo, Anthony C., 3,965,680.

PPG Industries, Inc.: *See—*
Carlin, William W., 3,966,576.
Schaefer, William L.; and Briar, Thomas J., 3,965,563.
Sullivan, Thomas R.; Du, John W.; Pelegrinelli, Raymond L.; and Das, Suryya K., 3,966,667.

Pragnell, Robert George: *See—*
Osterfield, John Richard; and Pragnell, Robert George, 3,966,299.

Prasad, Raj Nandan; and Stein, Herman Hal, to Abbott Laboratories. Platelet aggregation inhibitors. 3,966,917, Cl. 424-180.000.

Pratt, Roy E.: *See—*
Bittensky, Joel S.; Dillingham, Edward W.; Menzies, William R., III; and Pratt, Roy E., 3,966,587.

Pravel & Wilson: *See—*
Brooks, William E., 3,967,185.

Preiser, Ralph H.; Stellwagen, Frank W.; and Rigazio, Anthony W., to General Time Corporation. Low power synchronous motor and line cord therefor. 3,967,147, Cl. 310-162.000.

Preud'homme, Jean: *See—*
Mancy, Denise; Ninet, Leon; and Preud'homme, Jean, 3,966,557.

Price Company Limited, The: *See—*
Beath, Laurence R.; and Vessie, Alexander M., 3,967,024.

Price, Edward John, to Colgate-Palmolive Company. Golf club head covers. 3,965,955, Cl. 150-52.00G.

Price Pfister Brass Mfg. Co.: *See—*
Lyon, Jack K., 3,965,936.

Price, Raymond C. Display rack for carpet samples. 3,965,583, Cl. 35-55.000.

Pringle, William: *See—*
Banks, Philip George; and Pringle, William, 3,966,992.

Procter & Gamble Company, The: *See—*
Dumbrell, Richard John, 3,966,629.
Kennedy, Timothy James, 3,966,994.
Oborn, Robert Edward, 3,966,991.

Produits Chimiques Ugine Kuhlmann: *See—*
Cuer, Jean-Pierre; and Texier, Nicole, 3,966,894.

Prokai, Bela, to Union Carbide Corporation. Polyether urethane foam. 3,966,650, Cl. 260-2.5AH.

Prokai, Bela, to Union Carbide Corporation. Polyether urethane foam. 3,966,784, Cl. 260-448.20N.

Proto Production Plastics, Inc.: *See—*
Hotchkiss, Kenneth W.; and Kopp, George A., Sr., 3,966,074.

Proud, Ralph A., Jr.: *See—*
Oliver, Stuart M.; Proud, Ralph A., Jr.; and Parsons, Sanford J., 3,967,255.

Pruitt, Robert L., Jr. Apparatus for affixing prealigned corner posts to box-like structures before assembling same. 3,965,557, Cl. 29-200.00J.

Prussin, Samuel B.; and Lozano, Davis S., to Dart Industries Inc. Package for dispensing an antiseptic composition. 3,966,090, Cl. 222-94.000.

Psensky, Miroslav, to Quaker Oats Company, The. Composite flexible mold. 3,966,165, Cl. 249-120.000.

Puckett, Gregory L.: *See—*
Wesson, Harold R.; Brown, Lester E.; and Puckett, Gregory L., 3,965,988.

Puddington, Ira Edwin: *See—*
Meadus, Frederick Weldon; Sparks, Bryan David; and Puddington, Ira Edwin, 3,967,034.

Puechl, Karl H.: *See—*
Foulds, Ronald B.; Kasberg, Alvin H.; Puechl, Karl H.; and Bleiberg, Melvin L., 3,966,550.

Pugh, Stanley Frederick: *See—*
Cairns, James Anthony; and Pugh, Stanley Frederick, 3,966,645.

Puhringer, Othmar: *See—*
Sernetz, Heinz; Puhringer, Othmar; and Hoscher, Rudolf, 3,965,974.

Pullman Incorporated: *See—*
Peterson, William H., 3,966,150.

Punater, Dinesh G., to Harris Corporation. Ink ductor system. 3,965,819, Cl. 101-350.000.

Puterbaugh, Richard L., to Franklin Manufacturing Company. Refrigeration apparatus and method for making same. 3,966,283, Cl. 312-214.000.

Putnam, Cecil J., Jr., to Putnam Pattern & Engineering Co. Machine tool tracer control system. 3,965,796, Cl. 90-13.00R.

Putnam Pattern & Engineering Co.: *See—*
Putnam, Cecil J., Jr., 3,965,796.

Putnam, Stearns T.: *See—*
Espy, Herbert H.; and Putnam, Stearns T., 3,966,684.
Espy, Herbert H.; and Putnam, Stearns T., 3,966,694.

Pye Limited: *See—*
Hutchings, Bernard David Francis; and Hubbard, Robert William, 3,965,733.

Pytlewski, Raymond: *See—*
Pytlewski, Steve, 3,966,127.

Pytlewski, Steve, to Pytlewski, Raymond; and Pytlewski, Theodore, part interest to each. Centrifugal device and process for concurrently rupturing and pulverizing granular material, particularly cereal grain. 3,966,127, Cl. 241-73.000.

Pytlewski, Theodore: *See—*
Pytlewski, Steve, 3,966,127.

Qantix Corporation: *See—*
Brown, John W., 3,966,301.

Qonaar Corporation: *See—*
Dominick, George G.; Lugowski, Ronald J.; Goodrich, Phillip D.; and Erickson, Kenneth, 3,966,116.

Q² Corporation: *See—*
Oliver, Stuart M.; Proud, Ralph A., Jr.; and Parsons, Sanford J., 3,967,255.

Quad Corporation: *See—*
deVries, Egbert, 3,965,698.

Quaker Oats Company, The: *See—*
Psensky, Miroslav, 3,966,165.

Questor Corporation: *See—*
Rousey, Donald L., 3,965,632.

Quick, David C., to Allis-Chalmers Corporation. Differential lubrication system. 3,966,020, Cl. 184-11.00R.

Quinlan, Patrick M., to Petrolite Corporation. Use of polyquaternary ammonium methylene phosphonates in chelating or scale inhibition. 3,966,630, Cl. 252-180.000.

Quoos, Kurt: *See—*
Ahrweiler, Karl-Heinz; Appenzeller, Valentin; Quoos, Kurt; and Kusters, Eduard, 3,965,769.

R. G. LeTourneau, Inc.: *See—*
Friend, Aaron D.; and Lindahl, Hilmer C., 3,967,171.

R.K.S. Societe Anonyme: *See—*
Martin, Jacques Lucien Joseph, 3,966,284.

R. L. Kuss & Co., Inc.: *See—*
Hickle, Jerry J., 3,965,546.

Rabek, Jan W., to Teledyne Industries, Inc. Pressure transducer. 3,965,746, Cl. 73-398.00C.

Rabussier, Bernard: *See—*
Hennart, Claude; Rabussier, Bernard; and Mandon, Jean-Pierre, 3,966,900.

Rachelle Laboratories Italia, S.p.A.: *See—*
Luciano, Franco Paolo, 3,966,808.

Rader Companies, Inc.: *See—*
Boubel, Richard W.; Babler, David C.; and Peter, Donald W., 3,965,748.

Radice, Peter F.: *See—*
King, James Ping; Simkin, Joseph; and Radice, Peter F., 3,966,486.

Radlmann, Eduard: *See—*
Christoph, Geert; Radlmann, Eduard; Nischk, Gunther; Bruns, Ludwig; and Schnuchel, Gunther, 3,966,835.
Ragailler, Franz. Artificial respiration appliance. 3,965,893, Cl. 128-145.800.
Rahaim, Thomas J.: *See—*
Booher, Claude R., Jr.; and Rahaim, Thomas J., 3,966,353.
Raikovsky, Jury Borisovich: *See—*
Andoniev, Sergei Mikhailovich; Zilberman, Leonid Borisovich; Kudinov, Gennady Alexandrovich; Kutsykovich, Dorina Borisovna; Filipiev, Oleg Vladimirovich; Kasyanov, Grigory Ivanovich; Zalmanovich, Grigory Borisovich; and Raikovsky, Jury Borisovich, 3,966,179.
Raimondi, Albert A., to Westinghouse Electric Corporation. High-load capacity, non-tilting thrust bearing. 3,966,279, Cl. 308-160.000.
Raisson, Gerard D.: *See—*
Honnorat, Yves C.; Raisson, Gerard D.; and Morlet, Jean G., 3,966,374.
Ralston Purina Company: *See—*
Carey, Paul L., 3,966,702.
Ramadier, Andre: *See—*
Beduchaud, Michel; and Ramadier, Andre, 3,966,187.
Ramanathan, Visvanathan, to Ciba-Geigy AG. 2,6-Dihydroxy-3-cyano-4-methylpyridine containing azo dyes which contain a functional amino group. 3,966,706, Cl. 260-156.000.
Ramlow, Gerhard G.: *See—*
Patton, John T., Jr.; Pizzini, Louis C.; Demou, John G.; and Ramlow, Gerhard G., 3,966,521.
Rammelt, Peter Paul: *See—*
Lademann, Rudolf; Lindner, Helmut; Martini, Thomas; and Rammelt, Peter Paul, 3,966,832.
Ramot University Authority for Applied Research & Industrial Development Ltd.: *See—*
Brull, Maurice A.; and Arcan, Mircea, 3,966,326.
Randel, John H.: *See—*
Schuppner, Harry R., Jr.; and Randel, John H., 3,966,976.
Randpalu, Adu, to Dominion Engineering Works, Limited. Follower roll suspension system. 3,966,106, Cl. 226-42.000.
Rank Xerox Ltd.: *See—*
Fukushima, Osamu; Matsumoto, Seiji; and Sato, Masamichi, 3,965,861.
Matsumoto, Seiji, 3,967,119.
Rasberger, Michael, to Ciba-Geigy Corporation. 4-Alkyl-1,4-diaza-5-oxo-cycloheptanes and their 1-oxyls. 3,966,711, Cl. 260-239.30R.
Rathgeb, Paul: *See—*
Varsanyi, Denis; Rathgeb, Paul; and Gass, Karl, 3,966,961.
Ratti, Giulio: *See—*
Chain, Ernst Boris; Buck, Kenneth William; Darbyshire, Joan Elizabeth; Banks, Geoffrey Talbot; Himmelweit, Fred; and Ratti, Giulio, 3,966,707.
Rawlings, Robert M.; and Maher, Anthony Ambrose, to Blue Wing Corporation. Feed supplements for ruminants. 3,966,998, Cl. 426-630.000.
Raymond Lee Organization, The: *See—*
Le Sueur, Alice E. J., 3,965,591.
Raymond Lee Organization, Inc., The: *See—*
Brown, Joseph F., 3,966,098.
Gelardi, August P., 3,966,138.
Nelson, Daryl A., 3,966,100.
Tummel, Harold, 3,966,217.
Rayner, George Geoffrey, to Colgate-Palmolive Company. Liquid abrasive compositions containing a silicate suspending agent. 3,966,432, Cl. 51-308.000.
Raytheon Company: *See—*
Chambers, Derek; and Harley, A. Leonard, 3,967,181.
Estlick, Raymond J., 3,965,798.
Razorenov, Vladimir Alexandrovich: *See—*
Khaidurov, Efim Leontievich; and Razorenov, Vladimir Alexandrovich, 3,965,604.
RCA Corporation: *See—*
Fuhrer, Jack Selig, 3,967,311.
Harper, Stanley Arthur, 3,966,474.
Kosonocky, Walter Frank; and Sauer, Donald Jon, 3,967,254.
Liller, Paul Richard, 3,966,287.
Scott, Howard Mulder, 3,967,182.
Stewart, Roger Green, 3,967,295.
Wheatley, Carl Franklin, Jr., 3,967,207.
Reber, Martin. Washbasin faucet installation with auxiliary fitting for mouth spray or similar apparatus. 3,965,937, Cl. 137-625.470.
Redman, Charles M., to United States of America, Army. Low level infrared camera (LLIR Camera). 3,967,121, Cl. 250-330.000.
Redmer, Wilbert; Rolin, Kenneth; and Nittel, Herman, to Abbott Laboratories. Continuous automated plastic molding apparatus. 3,966,038, Cl. 198-20.00R.
Reese, Raymond E., to Frodsham, E. Dale. Disposal vehicle. 3,966,067, Cl. 214-302.000.
Reeves, Tom. Criminal trap. 3,965,827, Cl. 109-3.000.
Regie Nationale des Usines Renault: *See—*
Bellarbre, Raymond; and Legavre, Marcel, 3,966,276.
Remy, Patrick, 3,967,082.
Vitalis, Raymond, 3,966,242.
Reich, Herbert A.; and Maier, Jack K., to United States of America, Army. Line integrated combination magnetic and strain line sensor. 3,967,262, Cl. 340-258.00R.
Reichlin, Erwin. Device for the manufacture and filling of packages. 3,965,651, Cl. 53-183.000.
Reif, Philip G.: *See—*
Almaula, Bipin C.; and Reif, Philip G., 3,967,001.
Reighard, Alan B.: *See—*
Scholl, Charles H.; and Reighard, Alan B., 3,965,856.
Reiland, Harold P., to Langdon Corporation, The. Athlete's landing pit cushion. 3,965,507, Cl. 272-104.000.
Reilly, Richard J.; Cornett, Walter Goza, III; Riddle, James H.; and Wharmby, David, to Respiratory Care, Inc. Disposable fluid collection container. 3,965,902, Cl. 128-276.000.
Reinhardt, Hans; and Ottertun, Harald Daniel, to MX Processor Reinhardt & Co. AB. Method of recovering metal from metalliferous waste. 3,966,569, Cl. 204-108.000.
Reinke, Friedhelm: *See—*
Seulen, Gerhard; Reinke, Friedhelm; and Stengel, Edgar, 3,967,089.
Reisdorff, Josef Helmut; Aichinger, Gerd; Haberkorn, Axel; Kolling, Heinrich; and Kranz, Eckart, to Bayer Aktiengesellschaft. 1-(4-Phenoxy-phenyl)-1,3,5-triazines. 3,966,725, Cl. 260-248.0NS.
Reisser, Fritz: *See—*
Seckinger, Karl; and Reisser, Fritz, 3,966,805.
Reiter, Herbert, to Siemens Aktiengesellschaft. Circuit arrangement for weighting a current according to magnitude and direction. 3,967,137, Cl. 307-235.00R.
Remy, Patrick, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Fluid pressure drop indicator for the hydraulic braking system of a vehicle. 3,967,082, Cl. 200-82.00D.
Renault, Philippe; Deschamps, Andre; and Dezael, Claude, to Institut Francaise du Petrole, des Carburants et Lubrifiants. Process for manufacturing sulfur from a solution of sodium sulfite. 3,966,891, Cl. 423-574.00R.
Rendina, John F.; and Larson, Paul E., to GCA Corporation. Sample introducer. 3,967,127, Cl. 250-441.000.
Renfro, Kenneth W.: *See—*
Guhl, Richard E.; and Renfro, Kenneth W., 3,966,254.
Renkert, John S., to Metropolitan Industries, Inc. Prefabricated building panel and method of making. 3,965,635, Cl. 52-434.000.
Renn, Donald W.; and Saravis, Calvin A., to Marine Colloids, Inc. Medium for use in bioassay and method of using same. 3,966,897, Cl. 424-1.500.
Renth, Ernst-Otto: *See—*
Schromm, Kurt; Mentrup, Anton; Renth, Ernst-Otto; and Traunecker, Werner, 3,966,814.
Repke, Virginia L.: *See—*
Mesek, Frederick K.; and Repke, Virginia L., 3,965,904.
Republic Steel Corporation: *See—*
Overton, Harold C., 3,966,282.
Research Corporation: *See—*
Winkler, Norlin T., 3,967,129.
Respiratory Care, Inc.: *See—*
Reilly, Richard J.; Cornett, Walter Goza, III; Riddle, James H.; and Wharmby, David, 3,965,902.
Reubens, Clarence Edmond; Campbell, Sterrett Paxton; and Marston, Lloyd Everett, to Paramount Packaging Corporation. Bagging apparatus. 3,965,654, Cl. 53-189.000.
Reul, Helmut: *See—*
Heimes, Horst Peter; and Reul, Helmut, 3,966,358.
Reuterhall, Alf Ragnar: *See—*
Helmer, Karin Ulla Elisabet; and Reuterhall, Alf Ragnar, 3,966,484.
Rexnord Inc.: *See—*
Haker, Edwin J.; Buelow, William H.; and Riddle, Charles F., 3,966,344.
Klatt, Kenneth G.; Walling, Ronald L.; and Hallstrom, James R., 3,966,657.
Reynolds, David E., to Continental Oil Company. Leak detection apparatus. 3,966,088, Cl. 222-63.000.
Reynolds, Dwight W.: *See—*
Kirk, William P.; and Reynolds, Dwight W., 3,966,613.
Reynolds Metals Company: *See—*
Featherston, Richard H.; Fischer, Joseph P.; Garing, Meriwether L.; and Wright, James R., 3,966,874.
Rezabek, Karel: *See—*
Semonsky, Miroslav; Rezabek, Karel; and Seda, Miroslav, 3,966,941.
Rhodes, Tony; and Gay, Derek John, to Mattel, Inc. Machine for placing substantially flat, open-throated elements on rods. 3,965,561, Cl. 29-211.00R.
Rhomberg, Alfred: *See—*
Berger, Herbert; Rhomberg, Alfred; Stach, Kurt; Vomel, Wolfgang; and Sauer, Winfriede, 3,966,743.
Rhone-Poulenc Industries: *See—*
Bargain, Michel, 3,966,531.
Rhone-Poulenc S.A.: *See—*
Gruffaz, Max; and Rollet, Bernard, 3,966,678.
Jeanmart, Claude; Leger, Andre; and Messer, Mayer Naoum, 3,966,931.
Mancy, Denise; Ninet, Leon; and Preud'homme, Jean, 3,966,557.
Rhone-Poulenc-Textile: *See—*
Allard, Pierre, 3,966,685.
Riat, Henri: *See—*
Oesterlein, Fritz; and Riat, Henri, 3,966,705.
Ribba, Alain, to Manufacture de Produits Chimiques Protex. Acrylic copolymers. 3,966,687, Cl. 526-317.000.
Ribka, Joachim; Engelhardt, Friedrich; and Piesch, Steffen, to Cassella Farbwerke Mainkur Aktiengesellschaft. Polymers based on N-formyl-N'-acryloyl-methylenediamines. 3,966,689, Cl. 526-306.000.

Rich Cue of Valley Stream Corporation: *See*—
Algaze, Isaac, 3,965,590.

Richards, Ernest Levon, to Deering Milliken Research Corporation. Wet mop head construction. 3,966,259, Cl. 300-21.000.

Richards, Victor: *See*—
Nessel, Jiri M., 3,965,762.

Richardson, James E.: *See*—
Shafer, Arthur B.; Richardson, James E.; and Shuirman, Jay L., 3,965,514.

Richardson-Merrell Inc.: *See*—
Webb, Norval Ellsworth, Jr., 3,966,949.

Richert, Wilhelm H.: *See*—
Kaplan, John J.; Richert, Wilhelm H.; and Trumblee, John W., 3,965,535.

Richter, Sidney B.; and Kyker, Glendon D., to Velsicol Chemical Corporation. Bis-(halophenyl) 2,3,5,6-tetrachloro-terephthalate and fire retardant compositions prepared therefrom. 3,966,676, Cl. 260-45.75B.

Ricoh Co., Ltd.: *See*—
Hasegawa, Haruo; Taniguchi, Hiroyoshi; Yamane, Shiro; Igawa, Takao; and Nagayama, Tomoshi, 3,966,471.
Kawa, Ryuichi, 3,967,241.
Komada, Kenya; and Kondo, Yoshiaki, 3,966,198.
Sanchez, Fred M.; Shirai, Yukio; Sakakibara, Toshiyuki; and Ohminato, Mitsuru, 3,965,556.

Riddle, Charles F.: *See*—
Haker, Edwin J.; Buelow, William H.; and Riddle, Charles F., 3,966,344.

Riddle, James H.: *See*—
Reilly, Richard J.; Cornett, Walter Goza, III; Riddle, James H.; and Wharmby, David, 3,965,902.

Ridgeway, John C. Lockable vegetation pot and saucer. 3,965,616, Cl. 47-34.00R.

Ridler, Keith Douglas; and Gosling, Alexander Bennett, to Strathearn Audio Limited. Phonograph auto-changer center spindle. 3,966,215, Cl. 274-10.00S.

Ridler, Keith Douglas; and Stanwell-Smith, Colin Howard, to Strathearn Audio Limited. Phonograph record detecting arrangement. 3,966,330, Cl. 356-156.000.

Ridpath, Robert R.; Clifford, Louis R.; and Groot, Hendrik, to TRW Inc. Low-brake fluid sensor. 3,967,238, Cl. 340-59.000.

Riebel, Hans-Jochem; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. O-ethyl-S-n-propyl-O-(2-bromo-4-cyanophenyl)-thionothiolphosphoric acid ester. 3,966,850, Cl. 260-940.000.

Riebel, Hans-Jochem; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. O,S-Dialkyl-O-(2-cyanophenyl)-thionothiolphosphoric acid esters and insecticidal and acaricidal compositions and method. 3,966,920, Cl. 424-210.000.

Riebel, Hans-Jochem: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lother; Behrenz, Wolfgang; Hammann, Ingeborg; Stendel, Wilhelm; and Homeyer, Bernhard, 3,966,730.

Rieber & Son A/S: *See*—
Parmann, Gunnar, 3,965,715.

Riedl, Rudi; Jungnickel, Regina; Nitsch, Rainer; Lein, Werner; Vetter, Lothar; Schone, Helmut; Weisbach, Gunter; Johne, Hans; Schott, Alfred; Forster, Karl-Heinz; and Johne, Albrecht, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Method and apparatus for controlled feeding of sheets to printing machines or the like. 3,966,197, Cl. 271-260.000.

Riew, Changkiu K.; Siebert, Alan R.; and Rowe, Eugene H., to B. F. Goodrich Company, The. Compositions containing epoxy resin, chain extender, functionally terminated elastomer and curing agent. 3,966,837, Cl. 260-837.00R.

Rigazio, Anthony W.: *See*—
Preiser, Ralph H.; Stellwagen, Frank W.; and Rigazio, Anthony W., 3,967,147.

Rinio, Johannes Augustus. Driving pulley mechanism. 3,965,767, Cl. 74-230.240.

Rivman, Samuel J.; Cohen, Bernard; and Da Costa, Alvaro, to Eastern Poly Packaging Company. Plastic snap fastener. 3,965,952, Cl. 150-3.000.

Rix Industries: *See*—
DeWolf, Charles F.; and Gault, William S., 3,966,437.

Ro-Search, Inc.: *See*—
Auberry, Horace Ray; and Liebscher, Anton, 3,965,517.

Robbins Company, The: *See*—
Fikse, Tyman H., 3,966,256.
Sugden, David B., 3,965,995.

Roberson, Donald L.; and Fronek, Donald K., to United States of America, Army. Dual edge and level (DEL) flip-flop. 3,967,206, Cl. 328-206.000.

Robert Bosch G.m.b.H.: *See*—
Finkbeiner, Ludwig; Jurinke, Rudolf; Leutner, Volkmar; and Romes, Roman, 3,965,918.

Roberts, Allan, to British Broadcasting Corporation. Data display systems. 3,967,268, Cl. 340-324.0AD.

Roberts, Anthony Charles, to Taylor Woodrow Construction, Limited. Prestressed concrete boiler closure. 3,965,630, Cl. 52-224.000.

Roberts, Charles Clifton, to Catalyst Research Corporation. Colorimetric vinyl chloride indicator. 3,966,440, Cl. 55-274.000.

Roberts, Edward O., to United States of America, Air Force. Air bladder seat cushion for high acceleration cockpit. 3,966,146, Cl. 244-122.00A.

Robertshaw Controls Company: *See*—
Bauer, Werner R., 3,967,086.
Rosenberg, David M.; Hild, Henry F.; and Stearley, John W., 3,965,755.

Robinson Brothers Ltd.: *See*—
Stevenson, Arthur; and Harkness, Neil, 3,966,601.

Robison, James W.: *See*—
Eads, Harold O.; and Robison, James W., 3,965,991.

Robitschek, Paul; Chappelie, Norman Andrew; and Lorimer, John Wallace, to Chembond Corporation. Liquid phenol-aldehyde adhesive for use in curtain-coating adhesive applicators. 3,966,658, Cl. 260-29.300.

Roblin Hope's Industries, Inc.: *See*—
Sauer, Gale E., 3,965,631.

Robusto, Paul F.; and Stephens, Craig P., to Hughes Aircraft Company. Sustained conductivity device comprising a plurality of Schottky barriers. 3,967,151, Cl. 313-398.000.

Roch, Gerald V., to Hurco Manufacturing Company, Inc. Adjustable die holder. 3,965,721, Cl. 72-462.000.

Roche, William J., to GTE Sylvania Incorporated. Method and apparatus for non-destructively measuring internal film resistance in a fluorescent lamp. 3,967,191, Cl. 324-20.00R.

Rochling, Hans; and Hartel, Kurt, to Hoechst Aktiengesellschaft. Triazino-bezimidazole fungicides. 3,966,932, Cl. 424-249.000.

Rock, Erich; and Mages, Bernhard, to Blum Gesellschaft m.b.H. Hinge device. 3,965,530, Cl. 16-130.000.

Rockwell International Corporation: *See*—
Anderson, Bruce D.; and Holmes, Alton B., 3,966,028.
Mayer, Abbott F.; and Morgan, David J., 3,967,280.

Rodgers, Gerald L.: *See*—
Ansted, Roger C.; and Rodgers, Gerald L., 3,965,692.

Rodi & Wienenberger, Aktiengesellschaft: *See*—
Ihringer, Gerhard, 3,965,670.

Roe, Anthony Maitland; Slater, Robert Antony; and Loev, Bernard, to Smith Kline & French Laboratories Limited. 1,4-Dihydropyridine compounds in treating hypertension. 3,966,946, Cl. 424-263.000.

Rogers, Charles H.; and Sage, Burton H., Jr., to Corning Glass Works. Automatic focusing system. 3,967,110, Cl. 250-201.000.

Roggenkamp, George H., to Eaton Corporation. Cooling system for semiconductors. 3,965,971, Cl. 165-39.000.

Rohe, Lother: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lother; Behrenz, Wolfgang; Hammann, Ingeborg; Stendel, Wilhelm; and Homeyer, Bernhard, 3,966,730.

Rohm GmbH: *See*—
Monsheimer, Rolf; and Pfleiderer, Ernst, 3,966,551.

Rohm and Haas Company: *See*—
Barrett, James Henry; and Clemens, David Henry, 3,966,489.
Kilbourn, Edward E.; and Weiler, Ernest D., 3,966,947.

Rohrs, Donald L.: *See*—
Kroger, Douglas J.; Kroger, Donald J.; Jensen, Winton D.; and Rohrs, Donald L., 3,966,076.

Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See*—
Hartung, Winfried, 3,965,735.
Simeth, Claus, 3,966,195.
Simeth, Claus, 3,966,196.

Rolin, Kenneth: *See*—
Redmer, Wilbert; Rolin, Kenneth; and Nittel, Herman, 3,966,038.

Rollei-Werke Franke & Heidecke: *See*—
Adamski, Gunter, 3,967,298.
Waaske, Heinz, 3,967,290.

Rollet, Bernard: *See*—
Gruffaz, Max; and Rollet, Bernard, 3,966,678.

Romero, Juan Alvarez. Footwear fabrication process. 3,965,516, Cl. 12-142.00V.

Romes, Roman: *See*—
Finkbeiner, Ludwig; Jurinke, Rudolf; Leutner, Volkmar; and Romes, Roman, 3,965,918.

Roos, John T.: *See*—
Gibbs, Orville J.; and Roos, John T., 3,966,611.

Roosli, Friedrich. Ski boot cover. 3,965,586, Cl. 36-7.300.

Rorden, Louis H., to Develco, Inc. Wireless subterranean signaling method. 3,967,201, Cl. 325-28.000.

Roschke, Wilfried: *See*—
Kovacs, Jenoe; Jung, Hans; Marx, Matthias; Spoor, Herbert; and Roschke, Wilfried, 3,966,655.

Rose, Edgar, to Outboard Marine Corporation. Single link slide rail suspension system. 3,966,004, Cl. 180-5.00R.

Rose, John Brewster: *See*—
Feasey, Ronald George; and Rose, John Brewster, 3,966,851.

Rosenberg, David M.; Hild, Henry F.; and Stearley, John W., to Robertshaw Controls Company. Control device having locking selector means. 3,965,755, Cl. 74-10.00R.

Rosenberg, Peretz. Fluid regulating devices. 3,965,934, Cl. 137-624.140.

Roser, Kenneth L., to Keystone Consolidated Industries, Inc. Particleboard screw. 3,965,793, Cl. 85-41.000.

Ross, Camilla B.; and Vos, Jerry A., to Union Carbide Corporation. Shirred collagen casing stick having an end closure and method of making the same. 3,965,537, Cl. 17-42.000.

Ross, John D. Filling aid for medicant syringe. 3,965,945, Cl. 141-27.000.

Ross, Stephen T.: *See*—
Kaiser, Carl; and Ross, Stephen T., 3,966,770.

Ross, William D.; and Sievers, Robert E. Analysis for nitrogen compounds by gas chromatography. 3,966,411, Cl. 23-230.00R.

Rossi, Albert, to Exxon Research and Engineering Company. Ethylene backbone polymers in combination with ester polymers having long alkyl side chains are low viscosity distillate fuel cold flow improvers. 3,966,428, Cl. 44-62.000.

Rossi, Paul C.: *See—*
Hannes, Karl; and Rossi, Paul C., 3,965,779.

Rossi, Umberto; and Basili, Pietro, to Societa Italiana Telecommunicazioni Siemens S.p.A. Frequency dividing network with odd integral step-down ratio. 3,967,205, Cl. 328-46.000.

Roth, Helmut, to Eaton Corporation. Fluid supply for occupant restraint system. 3,966,226, Cl. 280-737.000.

Rothmans of Pall Mall (Australia) Limited: *See—*
Fair, Graeme David; Hasmall, Derek Lesley Arthur; Ryan, William Patrick; and Sellman, Edwin John, 3,966,912.

Rousey, Donald L., to Questor Corporation. Fire rated grid. 3,965,632, Cl. 52-232.000.

Roussel-UCLAF: *See—*
Godbille, Etienne; and Tondu, Lucette, 3,966,609.
Martret, Odile Le; and Clemence, Francois, 3,966,950.

Rowe, Eugene H.: *See—*
Riew, Changkiu K.; Siebert, Alan R.; and Rowe, Eugene H., 3,966,837.

Rowe International Inc.: *See—*
Steiner, Larry E., 3,966,047.

Rowley, William N.; and Ehret, Gordon F., to Weil-McLain Co., Inc. Pumping assembly. 3,966,363, Cl. 417-423.00R.

Roxon Oy: *See—*
Juvonen, Esko; and Virtanen, Pentti, 3,965,799.

Roy, Jean Claude, to Hewlett-Packard Company. Display apparatus having improved cursor enhancement. 3,967,266, Cl. 340-324.0AD.

Rozmus, John J. Golf club. 3,966,210, Cl. 273-169.000.

Rozsa, Laszlo; Meszaros, Lajos; and Mogyorodi, Ferenc, to Eszakmagyarorszagi Vegyimuvek. Method for producing chloroformates. 3,966,786, Cl. 260-463.000.

RPC Corporation: *See—*
Fathauer, Jack E., 3,966,069.

RPM Marketing Enterprises, Inc.: *See—*
Metzler, Robert P., 3,966,231.

RPR, Inc.: *See—*
Parker, Robert, 3,965,742.

Rubber Engineering, Inc.: *See—*
Jentzsch, David P.; Anderson, Hyrum T.; and Olsen, Lee J., 3,965,967.

Rubenstein, Kenneth E.; and Ullman, Edwin F., to Syva Company. Compounds for enzyme amplification assay methadone analogs. 3,966,556, Cl. 195-63.000.

Rubin, Leon J.: *See—*
Bharucha, Kekhusroo R.; Cross, Charles K.; and Rubin, Leon J., 3,966,974.

Rudolph, Hans: *See—*
de Cleur, Eckhard; Dhein, Rolf; Rudolph, Hans; and Kreuder, Hans Joachim, 3,966,836.

Rufenacht, Kurt: *See—*
Beriger, Ernst; Kristiansen, Odd; Rufenacht, Kurt; and Bader, Jorg, deceased, 3,966,921.
Bohner, Beat; Dawes, Dag; Meyer, Willy; Kristinsson, Haukur; and Rufenacht, Kurt, 3,966,754.

Rufer, Clemens; Schroder, Eberhard; and Kessler, Hans-Joachim, to Schering Aktiengesellschaft. Nitroimidazolyl pyrimidines. 3,966,732, Cl. 260-256.40C.

Ruggles, Benjamin C.: *See—*
Eloranta, Vaito K.; and Ruggles, Benjamin C., 3,967,297.

Rule, Norman G.: *See—*
Contois, Lawrence E.; and Rule, Norman G., 3,966,468.

Runion, William A.: *See—*
Hastings, Charles E.; and Runion, William A., 3,967,277.

Rupp, Peter R. R.: *See—*
Sanford, Walter E., Jr.; and Rupp, Peter R. R., 3,966,099.

Rush, William F.; Macriss, Robert A.; and Weil, Sanford A., to Gas Developments Corporation. Metallic sensible heat exchanger. 3,965,695, Cl. 62-271.000.

Russell, James B.: *See—*
Anderson, Robert L., Jr.; and Russell, James B., 3,967,270.

Russell, Lewis K.: *See—*
Muller, Richard S.; and Russell, Lewis K., 3,967,307.

Russo, Gary L.: *See—*
Harter, Robert M., deceased; and Russo, Gary L., 3,966,119.

Rutherfoord, James K.: *See—*
Bussey, Francis H., Jr.; and Rutherfoord, James K., 3,966,383.

Rutherford, David: *See—*
Suschitzky, John Louis; and Rutherford, David, 3,966,783.

Rutt, Truman C., to N L Industries, Inc. Process for forming internal conductors and electrodes. 3,965,552, Cl. 29-25.420.

Ryan, William Patrick: *See—*
Fair, Graeme David; Hasmall, Derek Lesley Arthur; Ryan, William Patrick; and Sellman, Edwin John, 3,966,912.

Ryobi, Ltd.: *See—*
Ishii, Koji, 3,965,818.

S. C. Johnson & Son, Inc.: *See—*
Hermann, James F., 3,965,519.
Muoio, Erland L., 3,965,518.

Sabo, Stephen C : *See—*
Babbin, William R.; and Sabo, Stephen C., 3,966,387.

Sachs, Charles E., to Commissariat a l'Energie Atomique. Apparatus for the sampling of blood and the separation of plasma under anaerobic conditions. 3,965,889, Cl. 128-2.00F.

Sacks, Martin E., to Cogas Development Company. Gasification method. 3,966,634, Cl. 252-373.000.

Sadan, Abraham. Concentration of underground brines in situ by solar evaporation. 3,966,541, Cl. 159-47.00R.

Sadoski, Tadius T.: *See—*
Milke, Howard W.; and Sadoski, Tadius T., 3,967,153.

Sadowski, Edward Peter, to International Nickel Company, Inc., The. Flux-coated arc welding electrode. 3,967,036, Cl. 428-386.000.

Safir, Sidney Robert: *See—*
Crawley, Lantz Stephen; and Safir, Sidney Robert, 3,966,756.
Hofmann, Corris Mabelle; and Safir, Sidney Robert, 3,966,748.

Sage, Burton H., Jr.: *See—*
Rogers, Charles H.; and Sage, Burton H., Jr., 3,967,110.

Sahasrabudhe, Arun P., to Westinghouse Electric Corporation. Signal threshold responsive apparatus. 3,966,148, Cl. 246-34.00R.

Sahasrabudhe, Arun P.: *See—*
Matty, Thomas C.; and Sahasrabudhe, Arun P., 3,966,149.

Saint-Gobain Industries: *See—*
Nunes, Emmanuel; and Vervin, Jacques, 3,966,048.

Saito, Jiro; Kimura, Kaoru; Kusuhara, Hiroshi; and Nakaguma, Kazuyoshi, to Ohbayashi-Gumi, Ltd.; and Japan Vilene Company, Ltd. Drain sheet material. 3,965,686, Cl. 61-11.000.

Saito, Yukio: *See—*
Tsukamoto, Kazuyoshi; Sakauchi, Yoshiaki; Saito, Yukio; and Ushijima, Kazufumi, 3,967,057.

Sakai, Hiroshi; Takeuchi, Fumio; and Hanake, Tsutomu, to Nippon Oils and Fats Company Limited. Slurry explosive composition containing a nitroparaffin and an amide. 3,966,516, Cl. 149-60.000.

Sakai, Kiyotoshi. Apparatus for charging raw materials into blast furnaces. 3,966,062, Cl. 214-35.00R.

Sakakibara, Toshiyuki: *See—*
Sanchez, Fred M.; Shirai, Yukio; Sakakibara, Toshiyuki; and Ohminato, Mitsuru, 3,965,556.

Sakamoto, Jyunji; Shiratani, Eisuke; and Imaizumi, Norio, to Tokyo Sanyo Electric Company, Ltd.; and Sanyo Electric Co., Ltd. Pulse generator stabilized for change of ambient temperature and source voltage. 3,967,216, Cl. 331-111.000.

Sakanai, Noriyuki: *See—*
Fukushima, Yoshikiyo; Momota, Kenzo; Shirahata, Hideaki; and Sakanai, Noriyuki, 3,966,375.

Sakata, Nobuhiro; and Suzuki, Toshihiro, to Nippon Pelnox Corporation; and Nippon Sheet Glass Co., Ltd. Coating composition for hardening the surface of cellulosic plastics and shaped articles of cellulosic plastics using said coating composition. 3,966,665, Cl. 260-32.80R.

Sakauchi, Yoshiaki: *See—*
Tsukamoto, Kazuyoshi; Sakauchi, Yoshiaki; Saito, Yukio; and Ushijima, Kazufumi, 3,967,057.

Sakurada, Ichio: *See—*
Ito, Shunji; Morioka, Yasuaki; Kajinaga, Yoshihiro; Nitta, Minoru; and Sakurada, Ichio, 3,966,454.

Sakurai, Yoshitoshi; Okura, Takao; and Tanaka, Miniru, to Honda Giken Kogyo Kabushiki Kaisha. Internal combustion engine. 3,965,881, Cl. 123-32.0SP.

Salway, Peter Hugh, to Lucas Electrical Company Limited, The. Spark ignition systems for internal combustion engines. 3,965,878, Cl. 123-148.00E.

Salzman, Donald F.: *See—*
Lorentz, Merle J.; and Salzman, Donald F., 3,965,866.

Sample, Lawrence Ray, to Motorola, Inc. Color television chroma demodulator circuit. 3,967,312, Cl. 358-23.000.

Sanchez, Fred M.; Shirai, Yukio; Sakakibara, Toshiyuki; and Ohminato, Mitsuru, to Ricoh Co., Ltd. Jacket holder. 3,965,556, Cl. 29-200.00J.

Sanders, Ernest E.: *See—*
Hollister, Ralph O.; and Sanders, Ernest E., 3,966,051.

Sandford, Wayne H., Jr., to United States of America, Navy. Digital to analog converter. 3,967,272, Cl. 340-347.0DA.

Sandoval, Secundino Rodriquez, to Investigaciones Tecnologicas Electromecanicas y Electronicas, S.A. Cartridge assembly for record player tone arm. 3,966,216, Cl. 274-25.000.

Sandoz Ltd.: *See—*
Ott, Hans; and Suess, Rudolf, 3,966,938.
Seckinger, Karl; and Reisser, Fritz, 3,966,805.
Stoll, Paul; and Toth, Istvan, 3,966,774.

Sandvik Aktiebolag: *See—*
Faber, Kurt Heinrich Albert Erich, 3,965,553.

Sanford, George G., Jr.: *See—*
Cachuela, Lawrence P.; and Sanford, George G., Jr., 3,967,103.

Sanford, Walter E., Jr.; and Rupp, Peter R. R., to Aladdin International, Inc. Two member pouring device having vent. 3,966,099, Cl. 222-478.000.

Sangster, Frederik Leonard Johan: *See—*
Teer, Kees; and Sangster, Frederik Leonard Johan, 3,967,055.

Sankyo Company Limited: *See—*
Aoki, Atsushi; Fukuda, Rikiya; Nakayabu, Toshio; Ishibashi, Keijiro; Takeichi, Chiyoko; and Ishida, Mitsuo, 3,966,914.

Sano, Akira: *See—*
Kawamata, Masanobu; Ushimaru, Hirokazu; Sano, Akira; and Takahashi, Yutaka, 3,966,918.

Sanyo Electric Co.: *See—*
Tsukamoto, Kazuyoshi; Sakauchi, Yoshiaki; Saito, Yukio; and Ushijima, Kazufumi, 3,967,057.

Sanyo Electric Co., Ltd.: *See—*
Miyamoto, Seiji, 3,967,313.

Sakamoto, Jyunji; Shiratani, Eisuke; and Imaizumi, Norio, 3,967,216.
Saravis, Calvin A.: *See*—
Renn, Donald W.; and Saravis, Calvin A., 3,966,897.
Sargeant, Graham Kenwood: *See*—
Emblem, Harold Garton; and Sargeant, Graham Kenwood, 3,967,003.
Saroy Engineering: *See*—
Shiber, Samuel, 3,966,010.
Sasaya, Hideaki; and Kobayashi, Akihiro, to Nippon Soken, Inc. Collision detection device. 3,967,079, Cl. 200-61.45R.
Sase, Eizo. Paper feeding apparatus for an automatic plane type paper punching machine. 3,966,059, Cl. 214-8.5SS.
Sato, Akira: *See*—
Hinata, Masanao; Takei, Haruo; Ikeda, Tadashi; Ogawa, Akira; Sato, Akira; and Iwamoto, Atuo, 3,966,477.
Sato, Chosei; Yamada, Yasutoku; and Takenaka, Yoshiyuki, to Showa Denko Kabushiki Kaisha. Device for waste heat recovery and sand removal in the Bayer process. 3,966,537, Cl. 159-2.00R.
Sato, Katsunobu; Sueda, Yoshihisa; Izutsutani, Yoshiro; Imada, Kunihiko; and Ohtake, Katsumasa, to Sumitomo Chemical Company, Limited. Azo disperse dye mixtures. 3,966,399, Cl. 8-26.000.
Sato, Masamichi, to Fuji Photo Film Co., Ltd. Method for producing a photomask. 3,966,473, Cl. 96-36.000.
Sato, Masamichi: *See*—
Fukushima, Osamu; Matsumoto, Seiji; and Sato, Masamichi, 3,965,861.
Sato, Mikio: *See*—
Toriyama, Kazuhisa; Abe, Hidetoshi; Nakano, Fumio; Murao, Kenji; and Sato, Mikio, 3,966,631.
Sato, Shigeyuki: *See*—
Kurobe, Moriji; Araga, Toshimi; Ito, Nobuhiro; Sato, Shigeyuki; and Takahashi, Hidero, 3,967,045.
Satzinger, Gerhard; and Herrmann, Manfred Franz, to Warner-Lambert Company. Thymol derivatives and a process for their preparation. 3,966,779, Cl. 260-404.000.
Satzinger, Gerhard; and Herrmann, Wolfgang Dieter, to Warner-Lambert Company. Process for the preparation of 1-(m- and p-hydroxyphenyl)-2-aminoethanol. 3,966,813, Cl. 260-570.600.
Saucier, Michel: *See*—
Monkovic, Ivo; Saucier, Michel; Lambert, Yvon; and Montzka, Thomas Alfred, 3,966,747.
Sauer, Donald Jon: *See*—
Kosonocky, Walter Frank; and Sauer, Donald Jon, 3,967,254.
Sauer, Gale E., to Roblin Hope's Industries, Inc. Fire rated grid-member with controlled expansion means. 3,965,631, Cl. 52-232.000.
Sauer, Winfriede: *See*—
Berger, Herbert; Rhomberg, Alfred; Stach, Kurt; Vomel, Wolfgang; and Sauer, Winfriede, 3,966,743.
Saunders, Jack L. Magnetic toy. 3,965,613, Cl. 46-238.000.
Savides, Christos: *See*—
Schurdak, Edward Joseph; and Savides, Christos, 3,966,675.
Sawa, Toshio: *See*—
Mukushi, Toshimi; Izumi, Kenkichi; Takahashi, Sankichi; Okazima, Yoshiaki; Sawa, Toshio; and Komai, Mithumasa, 3,966,562.
Sawaguri, Yasuyoshi: *See*—
Ohkawa, Masaaki; and Sawaguri, Yasuyoshi, 3,966,594.
Saxon, Richard A., to Burroughs Corporation. Circuit for operating a bar graph display panel. 3,967,158, Cl. 315-169.0TV.
Sayles, David C., to United States of America, Army. Fire-retardant insulation for rocket motors. 3,966,663, Cl. 260-31.40R.
Sbragia, Ronald J.: *See*—
Edamura, Fred Y.; and Sbragia, Ronald J., 3,966,937.
Schaefer, William L.; and Briar, Thomas J., to PPG Industries, Inc. Method and apparatus for removing cutting blades from an annular cutting head. 3,965,563, Cl. 29-427.000.
Schaffling, Otto G., to Olin Corporation. Solid rocket motor. 3,965,676, Cl. 60-255.000.
Schaffner, Carl P.; and Gordon, Harry W., to Schmid Laboratories, Inc. Method for treating hypercholesterolemia with mediocidin. 3,966,910, Cl. 424-115.000.
Schaffner, Carl P.: *See*—
Gordon, Harry W.; and Schaffner, Carl P., 3,966,911.
Schain, David B.; and Kagan, Morton R. Tennis serve practice device and method of using same. 3,966,205, Cl. 273-29.00A.
Schallus, Erich: *See*—
Vogt, Wilhelm; Neumaier, Hubert; Schallus, Erich; and Peantek, Gunter, 3,966,803.
Schanefelt, Robert V.: *See*—
Cremer, Charles W.; Eastman, James E.; and Schanefelt, Robert V., 3,966,990.
Scharrer, Werner; and Beyer, Fritz, to Stettner & Co. Multiple miniature capacitor. 3,967,167, Cl. 317-242.000.
Schaub, Robert Eugene: *See*—
Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 3,966,773.
Scheiber, Werner, to Metallgesellschaft Aktiengesellschaft. Apparatus for coating of hollow bodies. 3,965,854, Cl. 118-66.000.
Schellenberg, Walter, to Max Sandherr AG. Box with a membrane which seals the box. 3,966,114, Cl. 229-51.0CE.
Schemali, Claude: *See*—
Hallais, Jean Philippe; Humbert, Alain; and Schemali, Claude, 3,966,513.
Schering Aktiengesellschaft: *See*—
Hofmeister, Helmut; Laurent, Henry; Wiechert, Rudolf; Annen, Klaus; and Steinbeck, Hermann, 3,966,713.
Philippson, Rainer, 3,966,714.
Rufer, Clemens; Schroder, Eberhard; and Kessler, Hans-Joachim, 3,966,732.
Schering Corporation: *See*—
Knapp, Julius Z.; and Zeiss, John C., 3,966,332.
Lehn, Jean-Marie, 3,966,766.
Scherrer, Igor; and Hersberger, Pierre, to Ebarches S.A. Device for the maintenance and control of the oscillations of the balance wheel of a timepiece. 3,965,667, Cl. 58-28.00A.
Schertz, Burtron D.: *See*—
Lucas, Larry D.; Schertz, Burtron D.; and Wilkinson, Lester, 3,967,203.
Scherzer, Julius; and Maher, Philip K., to W. R. Grace & Co. Rare earth transition metal exchanged faujasites and catalysts prepared therefrom. 3,966,643, Cl. 252-455.00Z.
Schexnayder, Lawrence F., to Caterpillar Tractor Co. Hydraulic circuit. 3,966,066, Cl. 214-146.00R.
Schillo, Robert Frederick, to Bell Telephone Laboratories, Incorporated. Telephone station identification system. 3,967,074, Cl. 179-18.0FH.
Schimmer, Rigobert: *See*—
Beerwerth, Wolfgang; Geppert, Albrecht; Gesing, Horst; and Schimmer, Rigobert, 3,965,567.
Schlage, Ernest L. Electric power coupler. 3,966,289, Cl. 339-4.000.
Schlapfer, Hans, to Ciba-Geigy Corporation. Coumarin derivatives. 3,966,755, Cl. 260-308.00A.
Schleppnik, Alfred A., to Monsanto Company. 2-Alkyl-oct-5-en-2-ols in fragrance compositions. 3,966,648, Cl. 252-522.000.
Schlumberger Technology Corporation: *See*—
Lavigne, Jean; Chesnel, Pierre; and Bouguyon, Gerard, 3,965,993.
Schmid, August, to Patentverwertungs - und Finanzierungsgesellschaft, SERANIA. Bowling pin alignment apparatus to uniformly align bowling pins end-for-end. 3,966,206, Cl. 273-43.00E.
Schmid Laboratories, Inc.: *See*—
Gordon, Harry W.; and Schaffner, Carl P., 3,966,911.
Schaffner, Carl P.; and Gordon, Harry W., 3,966,910.
Schmidt, Felix Helmut: *See*—
Kampe, Wolfgang; Fauland, Erich; Stach, Kurt; Stork, Harald; and Schmidt, Felix Helmut, 3,966,916.
Schmitt, Josef, deceased (by Schmitt, Marcelle Armande Georgette, administratrix), to Ciba Midy. Intermediates for preparing 1,4-benzodiazepine-2-ones having a carboxylic acid ester or amide group in the 3-position. 3,966,793, Cl. 260-471.00A.
Schmitt, Marcelle Armande Georgette, administratrix: *See*—
Schmitt, Josef, deceased, 3,966,793.
Schmitt, Otto, to Dunlop Limited. Tire building machinery. 3,966,536, Cl. 156-401.000.
Schnall, Gunther: *See*—
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Pfeifer, Josef; and Schnall, Gunther, 3,966,316.
Schneider, Heinrich; and Boser, Ernst, to Klockner-Humboldt-Deutz Aktiengesellschaft. Pressure roller stand for forcible longitudinal displacement of large rotating drums. 3,966,395, Cl. 432-103.000.
Schneider, Henry Allen, to Breakthrough Research & Development Corporation. Portable vehicle scales. 3,966,002, Cl. 177-136.000.
Schneider, John J.: *See*—
Wittko, Joseph N.; Harding, David G.; Schneider, John J.; and Gonsalves, Joseph E., 3,966,147.
Schnell, Hermann: *See*—
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Schneller, Joseph W.; Bennett, Duane C.; and Matiacio, George P., to National Gypsum Company. Reinforced wallboard. 3,967,016, Cl. 427-393.000.
Schnuchel, Gunther: *See*—
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Schoengold, Ronald J.: *See*—
Pagano, Joseph F.; and Schoengold, Ronald J., 3,966,552.
Schoenholz, Daniel; and Weinberg, Myron S., to Warner-Lambert Company. Catamenial tampon. 3,965,905, Cl. 128-285.000.
Scholl, Charles H.; and Reighard, Alan B., to Nordson Corporation. Adhesive wheel applicator device. 3,965,856, Cl. 118-202.000.
Scholten, Frank L.; and Kubinak, Ronald A., to Addressograph Multigraph Corporation. Photocomposition machine. 3,967,177, Cl. 318-603.000.
Scholten, Heinz: *See*—
Feldmann, Rainer; Kriesten, Wolfgang; Muller, Karl Adolf; Panoch, Hans Joachim; and Scholten, Heinz, 3,966,838.
Schon, Franz: *See*—
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 3,966,400.
Schone, Helmut: *See*—
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Schooler, William H., Sr.; and Schooler, William H., Jr. Food product packaging apparatus. 3,965,655, Cl. 53-225.000.

Schoppe, Wayne F.: *See—*
Taylor, Thomas N.; and Schoppe, Wayne F., 3,966,189.

Schosek, William O. Rod and pipe pusher, puller device. 3,966,169, Cl. 254-29.00R.

Schott, Alfred: *See—*
Riedl, Rudi; Jungnickel, Regina; Nitsch, Rainer; Lein, Werner; Vetter, Lothar; Schone, Helmut; Weisbach, Gunter; Johne, Hans; Schott, Alfred; Forster, Karl-Heinz; and Johne, Albrecht, 3,966,197.

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Schramm, Florence J., executrix: *See—*
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Schramm, Harold J., deceased (by Schramm, Florence J., executrix); McCullough, John R.; and Yarnall, Joseph P., to Schramm, Inc. Air trap. 3,966,854, Cl. 261-64.00R.

Schramm, Inc.: *See—*
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Schrider, Michael Stanley; and Levy, Stephen David, to American Cyanamid Company. O,O,O',O'-Tetraethyl-S,S'-methylene-bis(p-phenylenethiomethylene). 3,966,848, Cl. 260-930.000.

Schrider, Michael Stanley: *See—*
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Schrock, Wilfried: *See—*
Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, 3,966,709.

Schrocksnadel, Peter. Improvements in or relating to a marking system. 3,965,596, Cl. 40-125.00N.

Schroder, Eberhard: *See—*
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Schroder, Peter, to Kraftwerk Union Aktiengesellschaft. Method and apparatus for inspecting tubular cavities. 3,966,871, Cl. 264-318.000.

Schromm, Kurt; Mentrup, Anton; Renth, Ernst-Otto; and Traunecker, Werner, to Boehringer Ingelheim GmbH. 1-Phenyl-2-(Naphthylalkyl-amino)-ethanols and salts thereof. 3,966,814, Cl. 260-570.600.

Schubert, Keith E.: *See—*
Lupkas, Raymond R.; and Schubert, Keith E., 3,965,815.

Schuessler, Jerome E., to Jeroll Mfg. Co. Method and apparatus for controlling web tension. 3,966,137, Cl. 242-75.430.

Schulte-Elte, Karl-Heinrich; Joyeux, Michel; and Ohloff, Gunther, to Firmenich S.A. Sesquiterpenic derivatives as odor- and taste modifying agents. 3,966,819, Cl. 260-586.00F.

Schultz, Gerhard L. Cargo container. 3,966,075, Cl. 220-1.500.

Schultz, Ronald A.: *See—*
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Schultz, Ronald L., to Chromalloy-Alcon Inc. Phonojack with grounding tab clamping means. 3,966,292, Cl. 339-91.00P.

Schultz, William G., to United States of America, Agriculture. Process for removing residual solvents. 3,966,981, Cl. 426-425.000.

Schultze, Hermann E.; and Schwick, Hans Gerhard, to Behringwerke Aktiengesellschaft. Disaggregated gamma globulin and process for preparing it. 3,966,906, Cl. 424-85.000.

Schulze, Rolf: *See—*
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Schumacher, Guenter: *See—*
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Schumacher, Gustav, II; and Schumacher, Guenter. Grain lifter for a corn reaping machine. 3,965,659, Cl. 56-313.000.

Schumaker, Donald R.: *See—*
Meacock, Leslie A., II; Schumaker, Donald R.; and Zalokar, Robert F., 3,966,009.

Schuman, Mark. Manually operated suction device for capturing small objects. 3,965,608, Cl. 43-110.000.

Schundehutte, Karl-Heinz: *See—*
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Schuppner, Harry R., Jr.; and Randel, John H., to Merck & Co., Inc. Foam stable malt beverage. 3,966,976, Cl. 426-329.000.

Schurdak, Edward Joseph; and Savides, Christos, to American Cyanamid Company. Thermal stabilizers for polypropylene. 3,966,675, Cl. 260-45.8NT.

Schwan, Thomas J., to Morton-Norwich Products, Inc. 2-Methyl-3-phenyl-1,2,3,7,8,8a-hexahydro-1H-cyclopent[i,j]-isoquinoline hydrobromide. 3,966,740, Cl. 260-286.00R.

Schwan, Thomas J.; and Miles, Nelson J., to Morton-Norwich Products, Inc. Anti-inflammatory 1-(substituted benzyl)-2-imidazolidinones. 3,966,758, Cl. 260-309.700.

Schwan, Thomas J., to Morton-Norwich Products, Inc. 1-(3,4-Dichlorobenzyl)-3-indazolinone. 3,966,759, Cl. 260-310.00A.

Schwan, Thomas J.; Davis, Charles S.; and Honkomp, Leroy J., to Morton-Norwich Products, Inc. 2-Substituted-5,6-dimethoxyindazoles. 3,966,760, Cl. 260-310.00C.

Schwarz, Hans-Helmut: *See—*
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Schwick, Hans Gerhard: *See—*
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LaBash, John David; and McGinniss, Vincent D., 3,966,574.
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Scott, Calvin L.; and Leopold, Howard S., to United States of America, Navy. Single chemical electric detonator. 3,965,951, Cl. 149-23.000.

Scott, Charles Mack: *See—*
Feast, Alan Arthur John; and Scott, Charles Mack, 3,966,661.

Scott, Gordon John: *See—*
Andrews, John Frederick Collett; Beton, Roy Victor; Leavens, Kenneth David; and Scott, Gordon John, 3,966,060.

Scott, Harry M. Chemical litter unit. 3,965,863, Cl. 119-1.000.

Scott, Howard Mulder, to RCA Corporation. Regulated switched mode multiple output power supply. 3,967,182, Cl. 321-18.000.

Scott, William T.: *See—*
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Scripto, Inc.: *See—*
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Sears, Karl David: *See—*
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Sebag, Henri: *See—*
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Seckinger, Karl; and Reisser, Fritz, to Sandoz Ltd. N,N'-diphenyl-N-(N''-alkylcarbamoyl)formamidines. 3,966,805, Cl. 260-553.00A.

Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Nothern Ireland, The: *See—*
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Seeland, Rodney F.: *See—*
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Seeley, Robert L., to United States of America, Navy. Coated magnetically biased reed switch. 3,967,224, Cl. 335-151.000.

Seiderman, Maurice. Contact lens from hydrophilic gel polymers of polyvinylpyrrolidone and hydroxyalkyl methacrylate. 3,966,847, Cl. 260-885.000.

Seidl, Hans: *See—*
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Selander, Stig Daniel; Marechal, Bernard; and D'Andrea, Corrado, to Isorel S.A.; and Selander, Stig Daniel. Manufacture of fiberboard according to the wet method with closed backwater system. 3,966,540, Cl. 162-13.000.

Seliger, Walter: *See—*
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Sellman, Edwin John: *See—*
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Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., to American Home Products Corporation. Oxamic acid derivatives for the prevention of immediate type hypersensitivity reactions. 3,966,965, Cl. 424-309.000.

Semenov, Pavel Vladimirovich: *See—*
Alexandrov, Nikolai Nikitievich; Zorev, Nikolai Nikolaevich; Krapukhin, Viktor Mikhailovich; Krotov, Viktor Vasilievich; Kryanin, Ivan Romanovich; Milman, Boris Samoilovich; Semenov, Pavel Vladimirovich; Sokolov, Nikolai Anatolievich; and Tinyakov, Viktor Gurievich, 3,965,968.

Semonsky, Miroslav; Rezabek, Karel; and Seda, Miroslav, to Spofa United Pharmaceutical Works. Composition for preventing lactation or pregnancy in mammals and the method for using the same. 3,966,941, Cl. 424-261.000.

Senda, Yasuhiro; and Ando, Sumitoshi, to Kokusai Denshin Denwa Kabushiki Kaisha. Control system of an electronic exchange. 3,967,250, Cl. 340-172.500.

Senet, Jean-Pierre G.; and Deweerdt, Julien C., to Societe Nationale des Poudres et Explosifs. Process for the preparation of aliphatic diol polycarbonates. 3,966,788, Cl. 260-463.000.

Sernetz, Heinz; Puhringer, Othmar; and Hoscher, Rudolf, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Continuous casting plant. 3,965,974, Cl. 165-89.000.

Serre, Hubert, to Pierre Fabre S.A. Medicaments intended for the prevention and treatment of ischemic disturbances. 3,966,923, Cl. 424-232.000.

Sette, Paul R.: *See—*
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Werkentin, Brian T., 3,966,997.
Shafer, Arthur B.; Richardson, James E.; and Shuirman, Jay L. Adjustable and/or removable fin for surfboards. 3,965,514, Cl. 9-310.00E.
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Sharp, John Howard: *See*—
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Shaw, Clarence W., to J. Ray McDermott & Co., Inc. Apparatus for anchoring a structure to the floor of a body of water. 3,965,687, Cl. 61-46.000.
Shaw, Wilfrid G.: *See*—
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Herment, Robert; Lafage, Yves; Emo, Jean Claude; and Yurcek, Jean Marie, 3,966,427.
Jenkins, John W.; Bauer, Ronald S.; and De La Mare, Harold E., 3,966,636.
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Pilgram, Kurt H. G., 3,966,817.
Shelton, Lawrence S.; Golsch, Rudolf A. M.; and Boigk, Dieter G., to Signode Corporation. Fastener strip. 3,966,042, Cl. 206-344.000.
Sheppard, M. Egan. Mixing support for castable material. 3,966,094, Cl. 222-187.000.
Sherman, Earle Conrad, to Olinkraft, Inc. Topper unit, machine and method. 3,965,643, Cl. 53-29.000.
Sherrick, James W., to Lord Corporation. Resilient truck axle bearing mounting. 3,965,825, Cl. 105-224.100.
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Shirota, Shyoji: *See*—
Ito, Akiro; Ichikawa, Yasushi; Horiguchi, Sadayuki; Shirota, Shyoji; Kayama, Yasuo; Chihara, Shiro; Haneda, Isoko; Hasuda, Katsumi; and Takano, Shyoichi, 3,966,913.
Shiseido Co., Ltd.: *See*—
Torii, Kenji; Ozawa, Tatsuya; Ono, Kimio; Iwabe, Koichi; and Horikawa, Hiroumi, 3,966,903.
Shishido, Yasuhisa: *See*—
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Shono, Tetsuji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Single lens reflex camera with interchangeable view finder having electrical coupling. 3,967,299, Cl. 354-219.000.
Shotkin, Robert, to Becton, Dickinson and Company. Fever indicator. 3,965,848, Cl. 116-114.500.
Showa Denko Kabushiki Kaisha: *See*—
Sato, Chosei; Yamada, Yasutoku; and Takenaka, Yoshiyuki, 3,966,537.
Shpakov, Oleg Nikolaevich: *See*—
Plotnikov, Andrei Dmitrievich; Soloviev, Viktor Andreevich; Ter-Mateosiants, Tigran Ovanesovich; and Shpakov, Oleg Nikolaevich, 3,965,759.
Shriver, David A.; and Gluckman, Melvyn I., to American Home Products Corporation. Anti-ulcer therapy. 3,966,955, Cl. 424-273.000.
Shubert, Albert, to Ameron, Inc. Apparatus for troweling pipe lining material. 3,966,389, Cl. 425-460.000.
Shuirman, Jay L.: *See*—
Shafer, Arthur B.; Richardson, James E.; and Shuirman, Jay L., 3,965,514.
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Wilson, Richard Arnold; Katz, Ira; Vock, Manfred H.; and Shuster, Edward J., 3,966,988.
Siczek, Bernard W., to Graco Inc. Overrun valve for air pumps. 3,965,927, Cl. 137-460.000.
Siebert, Alan R.: *See*—
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Siegel, Hardo: *See*—
Aquila, Werner; Himmele, Walter; Fliege, Werner; and Siegel, Hardo, 3,966,827.
Siegwart, Emil. Flow regulator for ducts. 3,965,928, Cl. 137-499.000.
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SIG Schweizerische Industrie-Gesellschaft: *See*—
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Signetics Corporation: *See*—
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Signode Corporation: *See*—
Shelton, Lawrence S.; Golsch, Rudolf A. M.; and Boigk, Dieter G., 3,966,042.
Sigworth, Frederick J., to Systron Donner Corporation. Low noise electronic circuit, transducer using the same, and method. 3,967,064, Cl. 179-1.00P.
Sika, Zigurd Karlovich: *See*—
Apsit, Voldemar Voldemarovich; Sika, Zigurd Karlovich; and Kikust, Daniel Petrovich, 3,967,145.
Silverberg, Morton, to Xerox Corporation. Belt transfer loading system. 3,966,199, Cl. 271-275.000.
Simek, Ferenc: *See*—
Vass, Karoly; Karpati, Gyorgy; Szechenyi-Marton, Eva; and Simek, Ferenc, 3,966,554.
Simeth, Claus, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Sheet delivery mechanism. 3,966,195, Cl. 271-189.000.
Simeth, Claus, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Sheet delivery mechanism. 3,966,196, Cl. 271-218.000.
Simkin, Joseph: *See*—
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Simowaki, Kazuharu: *See—*
Tanaka, Toshiaki; Yamaguchi, Shunsuke; and Simowaki, Kazuharu, 3,965,962.

Sims, Willard M., to Foster Grant Co., Inc. Homogeneous blends of polyamides with vinyl aromatic resins. 3,966,839, Cl. 260-857.0UN.

Singer Company, The: *See—*
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Singleton, Frank Henry; Gosden, Derek Vernon; and Woodhouse, Graham, to Woodall-Duckham, Limited. Gas purification. 3,966,876, Cl. 423-233.000.

Sipek, Ladislav; and Smars, Erik, to Centro-Maskin i Goteborg AB. Method and apparatus for thermochemical gas scarfing. 3,966,504, Cl. 148-9.500.

Sipple, Douglas E.: *See—*
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Sircar, Jagadish C.; Zinnes, Harold; and Shavel, John, Jr., to Warner-Lambert Company. Process for producing benzothiopyrans. 3,966,765, Cl. 260-327.0TH.

Sirven, Jacques. Hydraulic shock absorber for vehicle suspension. 3,966,030, Cl. 188-318.000.

Sjodin, Arne V.: *See—*
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Sjoman, Carl F., to Team Industries. Brief folding and packaging apparatus. 3,965,647, Cl. 53-117.000.

Sjoquist, Erik Ivar: *See—*
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Sjoquist, John A.; and Sjodin, Arne V., to Pharmacia Diagnostics AB. Method and reagent for determining immunologic materials. 3,966,898, Cl. 424-12.000.

Skobel, Max. Balanced flow cross-head. 3,965,931, Cl. 137-561.00A.

Skomoroski, Robert M.: *See—*
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Skoures, Alexander E.; and Farace, Joseph N., to United States of America, Navy. Discriminating sonic detection system. 3,967,209, Cl. 330-86.000.

Skurski, James K.: *See—*
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Slater, Robert Antony: *See—*
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Slipiec, Romuald E.; and Schultz, Ronald A., to Ozone Incorporated. Corona discharge ozone generating unit. 3,967,131, Cl. 250-539.000.

Slovensky, Mike J., Jr., to Cleveland Hardware & Forging Co. Method of making a latching assembly. 3,965,564, Cl. 29-434.000.

Small, Hamish: *See—*
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Smiley, Don A. Hub cap locking device. 3,965,708, Cl. 70-166.000.

Smith, Carroll M.: *See—*
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Smith, Charles E. Transporting apparatus. 3,965,843, Cl. 115-19.000.

Smith, Clive Percy, to Imperial Chemical Industries Limited. Polyester composition. 3,966,671, Cl. 260-40.00R.

Smith, Edwin W., Jr.: *See—*
Sidrissette, Edward C.; and Smith, Edwin W., Jr., 3,965,525.

Smith, Gordon Frederick; and Budd, Michael Keith, to Alcan Research and Development Limited. Lubricants for cold working of aluminium. 3,966,619, Cl. 252-32.500.

Smith, Gordon R. Self-launching glider. 3,966,143, Cl. 244-16.000.

Smith, Howard S., to Westinghouse Electric Corporation. Method for forming wound circular magnetic cores into rectangular cores. 3,965,717, Cl. 72-364.000.

Smith International, Inc.: *See—*
Williamson, Joseph Stephen, 3,965,980.

Smith Kline & French Laboratories Limited: *See—*
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Smith, Ora M.: *See—*
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SmithKline Corporation: *See—*
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Smulewicz, Jan J., to Nuclear Associates, Inc. Infant immobilizing device. 3,967,128, Cl. 250-444.000.

Snam Progetti S.p.A.: *See—*
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Sobajima, Shigenobu; Okaniwa, Hiroshi; Chiba, Kiyoshi; and Takagi, Norio, to Teijin Limited. Method for forming images by differential oxidation. 3,967,285, Cl. 346-74.00E.

Societa' Farmaceutici Italia S.p.A.: *See—*
Bernardi, Luigi; Bosisio, Germano; and Fregnan, Gian Carlo, 3,966,739.

Societa Italiana Telecommunicazioni Siemens S.p.A.: *See—*
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Societe Anonyme dite ATO CHIMIE: *See—*
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Societe Anonyme Francaise du Ferodo: *See—*
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Societe Anonyme: Glaenzer Spicer: *See—*
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Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
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Societe d'Etudes Verrieres: *See—*
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Societe Meusienne de Constructions Mecaniques: *See—*
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Societe Nationale des Poudres et Explosifs: *See—*
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Sodeco-Saia S.A.: *See—*
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Sokolov, Nikolai Anatolievich: *See—*
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Sola Basic Industries, Inc.: *See—*
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Solitron Devices, Inc.: *See—*
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Solo Cup Company: *See—*
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Solomon, Arthur H., to Arthur D. Little, Inc. Modulator for digital microwave transmitter. 3,967,217, Cl. 332-9.00R.

Soloviev, Viktor Andreevich: *See—*
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Solvay & Cie: *See—*
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Somekh, George Solomon, to Union Carbide Corporation. Process for the separation of aromatic hydrocarbons from a mixed hydrocarbon feedstock. 3,966,589, Cl. 208-321.000.

Someya, Shinzo: *See—*
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Sommer, Alfred, to Ceramic Magnetics, Inc. Method of making thin film thermistor. 3,966,578, Cl. 204-192.000.

Somogyi, Bela, to Hughes Aircraft Company. Electronic watch construction. 3,965,665, Cl. 58-23.0BA.

Sonoyama, Yuzo; Ohi, Akira; and Hozumi, Yukio, to Daicel Ltd. Self-extinguishing polystyrene resin composition. 3,966,677, Cl. 260-45.85T.

Sony Corporation: *See—*
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Sood, Raman Radha: *See—*
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Soodak, Charles; and Macemon, James H., to Baxter Laboratories, Inc. Wavelength-corrected spectrofluorometer. 3,967,113, Cl. 250-214.00C.

South African Inventions Development Corporation: *See—*
Berrange, Aubrey Ralph, 3,966,346.

Southern, John H.: *See—*
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Southern Webbing Mills: *See—*
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Spaeth, Edmund E.: *See—*
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Spain, Raymond G. Two piece brake disc. 3,966,029, Cl. 188-218.0XL.

Sparks, Bryan David: *See—*
Meadus, Frederick Weldon; Sparks, Bryan David; and Puddington, Ira Edwin, 3,967,034.

Spears, Wayne. Apparatus for forming a groove in a tube. 3,966,385, Cl. 425-393.000.

Speck, Ronald M. Earthquake valve. 3,965,917, Cl. 137-38.000.

Spector, George: *See—*
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Spencer, Elbert: *See—*
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Spencer, William H., to Bell & Howell Company. Temperature compensation circuit for sensor of physical variables such as temperature and pressure. 3,967,188, Cl. 323-75.00B.

Sperry, Philip R.: *See—*
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Campbell, Willis R.; Waldrop, Thomas W.; and Seymour, Shaun A., 3,966,063.
Dietrich, John Peter, 3,967,236.
Moore, Harry W., III; and McGee, Richard R., 3,967,059.

Spierings, Ferdinand Hubert Franciscus Gerardus. Hall-voltage device. 3,967,144, Cl. 310-10.000.
Spink, Donald R., to Amax Speciality Metal Corporation. Separation of zirconium and hafnium. 3,966,458, Cl. 75-84.500.
Spink, Donald R., to Amax Specialty Metal Corporation. Reduction of metal halides. 3,966,460, Cl. 75-84.400.
Spofa United Pharmaceutical Works: *See—*
Semonsky, Miroslav; Rezabek, Karel; and Seda, Miroslav, 3,966,941.
Spoor, Herbert: *See—*
Kovacs, Jenoe; Jung, Hans; Marx, Matthias; Spoor, Herbert; and Roschke, Wilfried, 3,966,655.
Spradlin, Erdman O. Method for high density recording of source credit transaction data. 3,965,820, Cl. 101-426.000.
Sprague, James W.; Feldman, Daniel W.; and Veatch, Frank, to Standard Oil Company. Manganese containing fuels. 3,966,429, Cl. 44-68.000.
Springer, Hartmut: *See—*
Meininger, Fritz; Hunger, Klaus; and Springer, Hartmut, 3,966,704.
Sproule, Robert Stanley. Drag reduction system in shrouded turbo machine. 3,966,351, Cl. 415-110.000.
Spurgeon, Richard C. False twisting device. 3,965,662, Cl. 57-77.330.
Square D Company: *See—*
Davies, Terrence Ardern, 3,966,464.
Srivastava, Dinesh K.; and Lee, David Q., to GTE Automatic Electric Laboratories Incorporated. Memory operation for 3-way communications. 3,967,070, Cl. 179-15.0AT.
Stach, Kurt: *See—*
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Kampe, Wolfgang; Fauland, Erich; Stach, Kurt; Stork, Harald; and Schmidt, Felix Helmut, 3,966,916.
Stadelmann, Ludwig; and Bauer, Fritz, to Suspa Federungstechnik Fritz Bauer & Sohne oHG. Lengthwise-adjustable gas spring. 3,966,182, Cl. 267-124.000.
Standard Electric Time Corporation: *See—*
Costantini, Joseph A.; Flint, Glen E.; and Lanier, Richard J., 3,966,107.
Standard Oil Company: *See—*
Callahan, James L.; Miller, Arthur F.; and Shaw, Wilfrid G., 3,966,639.
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Standardwerk Eugen Reis GmbH: *See—*
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Stanley, Richard B. Linear actuator. 3,965,761, Cl. 74-89.150.
Stantial, Thomas D.: *See—*
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Stanwell-Smith, Colin Howard: *See—*
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Stark, Bernard Peter: *See—*
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Stauffer Chemical Company: *See—*
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Baker, Don R.; Walker, Francis H.; and Letchworth, Peter E., 3,966,809.
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Stearley, John W.: *See—*
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Steele, Robert E., to General Motors Corporation. Vehicle anti-theft alarm circuit. 3,967,239, Cl. 340-63.000.
Steffenssen, Otto: *See—*
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Stehle, Edward J.: *See—*
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Stein, William H., Jr., to Hill-Rom Company, Inc. Adjustable bed with automatic knee break. 3,965,500, Cl. 5-68.000.
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Steiner, Larry E., to Rowe International Inc. Paper currency acceptor. 3,966,047, Cl. 209-75.000.
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Stengel, Edgar: *See—*
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Stenzenberger, Horst, to Technochemie GmbH Verfahrenstechnik of Heidelberg. Filament-wound reinforced plastic articles and process of making and using same. 3,966,864, Cl. 264-137.000.
Stenzenberger, Volkmar: *See—*
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Stepanek, Karel, to Vyzkumny ustav obrabecich stroju a obrabeni. Device for indicating the touching of a grinding wheel and a workpiece. 3,965,622, Cl. 51-165.00R.
Stephens, Craig P.: *See—*
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Stephens, James O., to Westinghouse Electric Corporation. Wet cooling tower with plume eliminator. 3,965,672, Cl. 60-39.500.
Stephens, Woodrow W. Carburetor adapter. 3,966,430, Cl. 48-180.00R.
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Stevens, Harold E., deceased (by Stevens, Joan, heir), to Mill & Mix Company, Inc. Combination grain mill and dough mixer. 3,966,178, Cl. 259-185.000.
Stevens, Joan, heir: *See—*
Stevens, Harold E., deceased, 3,966,178.
Stevens, Timothy S.; and Small, Hamish, to Dow Chemical Company, The. High performance, crtion-exchange chromatography on surface-sulfonated compositions. 3,966,596, Cl. 210-24.000.
Stevenson, Arthur; and Harkness, Neil, to Robinson Brothers Ltd. Effluent treatment. 3,966,601, Cl. 210-53.000.
Stevenson, Paul D.: *See—*
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Steward Plastics, Inc.: *See—*
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Steward, William L., to Steward Plastics, Inc. Method of making helically wound plastic tubing. 3,966,525, Cl. 156-195.000.
Stewart, James S.: *See—*
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Stewart, John Kenneth, to Canron, Inc. Shoulder tamping lifting jack. 3,965,822, Cl. 104-7.00B.
Stewart, Roger Green, to RCA Corporation. Input transient protection for integrated circuit element. 3,967,295, Cl. 357-51.000.
Stewart, Sherwin R. Shoe attachment for sports. 3,965,585, Cl. 36-125.000.
Stich, Frederick A., to Allis-Chalmers Corporation. Transistor bridge inverter motor drive having reduced harmonics. 3,967,173, Cl. 318-227.000.
Stock, Arthur J.; Christofer, Donald E.; and Brinza, Joseph E., to Stock Equipment Company. Apparatus for introducing particulate material into a container. 3,966,175, Cl. 259-8.000.
Stock Equipment Company: *See—*
Stock, Arthur J.; Christofer, Donald E.; and Brinza, Joseph E., 3,966,175.
Stocker, Lester H., to Bell & Howell Company. Apparatus and method for mail preparation. 3,965,644, Cl. 53-29.000.
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Stoll, Paul; and Toth, Istvan, to Sandoz Ltd. Process for the production of amino-anthraquinone. 3,966,774, Cl. 260-378.000.
Stone, Orison W. Method of forming reinforced carton. 3,965,803, Cl. 93-36.00M.
Storace, Anthony; and Sette, Paul R., to Pitney-Bowes, Inc. Mail handling stacking and feeding apparatus. 3,966,193, Cl. 271-150.000.
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Strathearn Audio Limited: *See—*
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Strathearn Audio Limited: *See—*
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Strazik, William F.: *See—*
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Strobel, Harry, to Pitney-Bowes, Inc. Sheet separating device. 3,966,191, Cl. 271-125.000.

Strom, Rolf: *See—*
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Stroterhoff, Howard L., to United States of America, Army. Lewisite detection sampler and method. 3,966,412, Cl. 23-232.00R.

Stroud, Edward John: *See—*
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Stroud Graphic Equipment Limited: *See—*
Stroud, William Felix, deceased; and Stroud, Edward John, 3,965,781.

Stroud, Lois Evelyn, executrix: *See—*
Stroud, William Felix, deceased; and Stroud, Edward John, 3,965,781.

Stroud, William Felix, deceased (by Stroud, Lois Evelyn, executrix); and Stroud, Edward John, to Stroud Graphic Equipment Limited. Bandsaw book trimmer. 3,965,781, Cl. 83-13.000.

Strutz, Ernst, to Biviator S.A. Apparatus for determining skin tolerance to ultra-violet radiation. 3,967,124, Cl. 250-372.000.

Strybel, Richard V., to Imperial-Eastman Corporation. Tube cutter. 3,965,572, Cl. 30-102.000.

Stuhmer, Werner: *See—*
Milkowski, Wolfgang; Zeugner, Horst; von Eickstedt, Klaus-Wolf; and Stuhmer, Werner, 3,966,735.

Stunger, Edward R., to Bigelow-Sanford, Inc. Knife blade support unit. 3,965,575, Cl. 30-294.000.

Sturm, Walter: *See—*
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Styles, Robert E.; and Les Veaux, John C., to Hanimex Pty. Ltd. Lens focusing means for slide projectors. 3,966,315, Cl. 353-101.000.

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Suchy, Milos: *See—*
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Sueda, Yoshihisa: *See—*
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Suess, Rudolf: *See—*
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Sugden, David B., to Robbins Company, The. Machine for boring a large diameter blind hole. 3,965,995, Cl. 175-57.000.

Suggitt, Robert M.; Gates, Walter C., Jr.; and Hudson, Ralph B., Jr., to Texaco Inc. Secondary alcohol process. 3,966,828, Cl. 260-639.00B.

Sugiyama, Toboru: *See—*
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Suh, Kyung W., to Dow Chemical Company, The. Extrusion of thermoplastic foam. 3,966,381, Cl. 425-376.000.

Sukup, Eugene G. Spreader for grain and like material. 3,966,124, Cl. 239-666.000.

Sullivan, Ann Clare: *See—*
Guthrie, Robert William; Hamilton, James Guthrie; Kierstead, Richard Wightman; Miller, O. Neal; and Sullivan, Ann Clare, 3,966,772.

Sullivan, Thomas R.; Du, John W.; Pelegrinelli, Raymond L.; and Das, Suryya K., to PPG Industries, Inc. Preparation of non-aqueous thermosetting acrylic polymer dispersions. 3,966,667, Cl. 260-33.6UA.

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Sundar, Parameshwaran; Elikan, Leonard; and Lyon, Ward L., to Westinghouse Electric Corporation. Coupled cationic and anionic method of separating uranium. 3,966,872, Cl. 423-9.000.

Sundar, Parameshwaran S.: *See—*
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Sundholm, Goran Vilhelm. Flange joint. 3,966,234, Cl. 285-24.000.

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Surmatis, Joseph Donald, to Hoffmann-La Roche Inc. Method for the purification of 6-methoxy-1-phenazinol 5,10-dioxide. 3,966,734, Cl. 260-267.000.

Sury, Francis P. Pressure responsive valve. 3,966,168, Cl. 251-58.000.

Suschitzky, John Louis; and Rutherford, David, to Fisons Limited. Compounds. 3,966,783, Cl. 260-439.0CY.

Susmu Industrial Co., Ltd.: *See—*
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Suspa Federungstechnik Fritz Bauer & Sohne oHG: *See—*
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Suyama, Satoshi; and Endow, Kazuhiko, to Tsurumi-Seiki Co., Ltd., The. Data recorder. 3,967,316, Cl. 360-51.000.

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Suzuki, Shigeru; and Adachi, Takeshi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument having dynamic range variable expression control. 3,965,790, Cl. 84-1.270.

Suzuki, Tetsuo; Mizoguchi, Katsuhiro; and Togo, Fumio, to International Flavors & Fragrances Inc. Electroconductive high polymer composition. 3,966,987, Cl. 252-500.000.

Suzuki, Toshihiro: *See—*
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Suzuki, Yoshikazu; Azuma, Katsumi; and Ishimura, Kiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for swage-forging shafts. 3,965,716, Cl. 72-356.000.

Swank Refractories Company, Inc.: *See—*
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Swank, Roy L. Blood autotransfusion method and apparatus. 3,965,896, Cl. 128-214.00R.

Swift, Harold E.: *See—*
Black, Edgar R.; Montagna, Angelo A.; and Swift, Harold E., 3,966,642.

Swift, John Alan: *See—*
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Swisher, James A. Internally silenced impact driven tools and impacting means therefor. 3,965,992, Cl. 173-127.000.

Swiss Aluminium Ltd.: *See—*
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Szmuszkovicz, Jacob, to Upjohn Company, The. 2,9-Dihydro-3H-pyrido[3,2-c]-s-triazolo[4,3-a][1,5]-benzodiazepin-3-ones. 3,966,736, Cl. 260-268.0PC.

Szonn, Bodo: *See—*
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Tada, Shinichi: *See—*
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Tada, Siro, to Matsushita Electric Industrial Co., Ltd. Channel indicator device. 3,965,850, Cl. 116-124.20R.

Tagashira, Yoshimi; Atobe, Masaaki; and Yamamoto, Kazuhiro, to Nippon Electric Company, Ltd. Variable delay equalizer. 3,967,220, Cl. 333-28.00R.

Taira, Kaoru; and Inoue, Hirotoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Main combustion chamber of swirl chamber type diesel engine. 3,965,872, Cl. 123-32.00C.

Takagi, Norio: *See—*
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Takahashi, Masaaki; Ito, Akira; and Igarashi, Yuriko, to Kureha Kagaku Kogyo Kabushiki Kaisha. Epoxy resin composition. 3,966,674, Cl. 260-45.70R.

Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Toki, Tadaaki; and Someya, Shinzo, to Ishihara Sangyo Kaisha Ltd. Herbicidal 2-halo-4-trifluoromethyl-4'-cyanophenyl-ethers. 3,966,453, Cl. 71-105.000.

Takahashi, Sankichi: *See—*
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Takamine, Bruce N. Air operated power transfer apparatus. 3,967,132, Cl. 290-4.00R.

Takano, Hiroshi: *See—*
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Takano, Shyoichi: *See—*
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Takasago Perfumery Co., Ltd.: *See—*
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Takase, Yahei; and Kawakami, Akira, to Mitsubishi Denki Kabushiki Kaisha. PNPN semiconductor device. 3,967,294, Cl. 357-38.000.

Takata, Satoshi: *See—*
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Takenaka, Shigeo; Shimizu, Hitoshi; and Ogawa, Masanobu, to Nippon Kayaku Kabushiki Kaisha. Process for preparing acrylic acid and oxidation catalyst. 3,966,802, Cl. 260-530.00N.

Takenaka, Shigeo; Shimizu, Hitoshi; and Yamamoto, Kenichiro, to Nippon Kayaku Kabushiki Kaisha. Process for preparing 1,3-butadiene and methacrolein simultaneously. 3,966,823, Cl. 260-604.00R.

Takenaka, Yoshiyuki: *See—*
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Takeuchi, Kikuo. Hot blast stove apparatus. 3,966,393, Cl. 432-40.000.

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Tamura Electric Works, Ltd.: *See—*
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Tamura, Yorikazu; and Shishido, Yasuhisa, to Teijin Limited. Method for preparing vinyl fluoride-hexafluoro-propylene resin and method for producing a coating therefrom. 3,966,660, Cl. 260-29.60F.

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Tanabe Seiyaku Co., Ltd.: *See—*
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Tanaka, Toshiaki; Yamaguchi, Shunsuke; and Simowaki, Kazuharu, to Toyo Kogyo Co., Ltd. Process for producing ductile iron casting. 3,965,962, Cl. 164-55.000.

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Tani, Junichi: *See—*
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Taniyama, Yukio; Isaka, Tetsuo; Nagahori, Tetsuo; and Kanda, Kaoru, to Fujitsu Ltd. Priority selection system in access control. 3,967,249, Cl. 340-172.500.

Tanizaki, Yoshiharu; Kawaguchi, Hiroshi; and Minagawa, Kenichiro, to Nippon Oils and Fats Company Limited. Lubricating oil composition containing polyoxyalkylene glycol diether viscosity-index improvers. 3,966,625, Cl. 252-52.00A.

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Taylor, Paul Franklin. Process for ilmenite ore reduction. 3,966,455, Cl. 75-21.000.

Taylor, Robert Ernest; Packer, Mervyn Brian; and Parsons, David, to Automotive Products Ltd. Fault detecting system for vehicle anti-skid control systems. 3,966,265, Cl. 303-21.0AF.

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Taylor, William P., III. Camera support. 3,966,101, Cl. 224-28.00R.

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Tedesco, Robert J., to Westinghouse Electric Corporation. Apparatus for loading fuel pellets in fuel rods. 3,965,648, Cl. 53-126.000.

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Thomas, Howard M.; and Borowiec, Richard A., to Wurlitzer Company, The. Stop tablet assembly. 3,965,791, Cl. 84-343.000.
Thomason, Harry Emmitte. Crop drying (food preserving) apparatus. 3,965,696, Cl. 62-324.000.
Thomson, Colin: *See—*
McFarland, James W.; and Thomson, Colin, 3,966,710.
Thomson-CSF: *See—*
Chavanat, Paul; Epsztein, Bernard; and Mourier, Georges, 3,967,155.
Thorowgood, Sydney William, to General Sports Manufacturing Limited. Sleeping bags. 3,965,505, Cl. 5-343.000.
Thrush, Richard G., to Weatherhead Company, The. Blend back proportioning valve for brake system. 3,966,263, Cl. 303-6.00C.
Thrush, Richard G.: *See—*
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Thurston, David L., to Abex Corporation. Controlled opening pressure compensated flow control valve. 3,965,921, Cl. 137-117.000.
Timex Corporation: *See—*
Wuthrich, Paul, 3,966,498.
Tinyakov, Viktor Gurievich: *See—*
Alexandrov, Nikolai Nikitievich; Zorev, Nikolai Nikolaevich; Krapukhin, Viktor Mikhailovich; Krotov, Viktor Vasilievich; Kryanin, Ivan Romanovich; Milman, Boris Samoilovich; Semenov, Pavel Vladimirovich; Sokolov, Nikolai Anatolievich, and Tinyakov, Viktor Gurievich, 3,965,968.
Tipton, William G., to Cavalier Packaging Company, Inc. One piece box folder. 3,966,113, Cl. 229-40.000.
Tissot, Raymond, to Sigma Diesel. Fuel injection pumps for internal combustion engines. 3,965,876, Cl. 123-139.000.
Togo, Fumio: *See—*
Suzuki, Tetsuo; Mizoguchi, Katsuhiro; and Togo, Fumio, 3,966,987.
Tohama, Akira: *See—*
Watanabe, Akinori; Tanoshima, Katsuhide; Ando, Takao; Tohama, Akira; and Nagano, Akio, 3,967,143.
Tojyo, Tsutomu, to Olympus Optical Co., Ltd. Telephoto lens system. 3,966,307, Cl. 350-216.000.
Toki, Tadaaki: *See—*
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Toki, Tadaaki; and Someya, Shinzo, 3,966,453.
Tokura, Katsuyuki; Maeda, Shuichi; Endo, Takeshi; Yoichizono, Kenji; and Asami, Hiroshi, to Fujitsu Ltd. Cash dispensing system. 3,965,913, Cl. 133-8.00R.
Tokuyama, Takashi: *See—*
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Tokyo Sanyo Electric Company, Ltd.: *See—*
Sakamoto, Jyunji; Shiratani, Eisuke; and Imaizumi, Norio, 3,967,216.
Tokyo Shibaura Electric Co., Ltd.: *See—*
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Tomioka, Tatsuo; Hoshide, Yasuo; Ogawa, Hirosi; and Suzuki, Kenichi, to Nikken Chemicals Co., Ltd. Process for producing desacetoxy cephalosporanic acid compound. 3,966,720, Cl. 260-243.00C.
Tomokazu, Suzuki; and Katuharu, Doma, to Kabushiki Kaisha Tamura Denki Seisakusho. Shutter type digital clock. 3,965,668, Cl. 58-126.00E.
Tondu, Lucette: *See—*
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Toray Industries, Inc.: *See—*
Asakura, Toshiyuki; Itoga, Masaaki; Hayakawa, Takeshi; and Tanimura, Masamitu, 3,966,686.
Torii, Kenji; Ozawa, Tatsuya; Ono, Kimio; Iwabe, Koichi; and Horikawa, Hiroumi, to Shiseido Co., Ltd. Sulfite or bisulfite hair-waving composition containing a wave accelerating agent. 3,966,903, Cl. 424-71.000.
Toriyama, Kazuhisa; Abe, Hidetoshi; Nakano, Fumio; Murao, Kenji; and Sato, Mikio, to Hitachi, Ltd. Nematic liquid crystal composition. 3,966,631, Cl. 252-299.000.
Toro Company, The: *See—*
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Toro, Joseph A., to TRW Inc. Distributed resistance-capacitance component. 3,967,222, Cl. 333-70.0CR.
Toth, Anton; and Meyer, Gerhard, to Akzo N.V. Process for the production of cyclic carboxylic acid imides. 3,966,726, Cl. 260-249.800.
Toth, Istvan: *See—*
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Toussaint, Francois: *See—*
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Townsend, Herbert E., Jr.; Horton, James B.; and Woodyatt, Louis R., to Bethlehem Steel Corporation. Ultra-high strength steel containing CaO, MgO, BaO or SrO having improved resistance to environmental stress corrosion cracking. 3,966,421, Cl. 29-182.500.
Toy, Arthur D. F.; and Eilers, Kenneth L., to Stauffer Chemical Company. N,N-Dialkyl O,O-bis(haloalkyl)phosphoramidate flame retardant. 3,966,478, Cl. 106-15.0FP.
Toyo Kogyo Co., Ltd.: *See—*
Tanaka, Toshiaki; Yamaguchi, Shunsuke; and Simowaki, Kazuharu, 3,965,962.
Toyo Soda Manufacturing Co., Ltd.: *See—*
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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Tranchart, Jean-Claude; and Bunel, Jacques Charles Louis, to U.S. Philips Corporation. Single crystal growth apparatus with fluid bearing and fluid drive means. 3,966,416, Cl. 23-273.0SP.
Traunecker, Werner: *See—*
Schromm, Kurt; Mentrup, Anton; Renth, Ernst-Otto; and Traunecker, Werner, 3,966,814.
Trecker, David John: *See—*
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Boltze, Karl-Heinz; Brendler, Otfried; Dell, Hans-Dieter; and Jacobi, Haireddin, 3,966,956.
Trosken, Jurgen, to Hoechst Aktiengesellschaft. Phenyl ethers. 3,966,826, Cl. 260-613.00R.
Troutman, Kenneth W.: *See—*
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Troy, Marion Frank; and Kamp, Ewald Albert, to Union Carbide Corporation. Linear apparatus and method for high speed production of air-laid non-woven webs. 3,966,858, Cl. 264-91.000.
Trumblee, John W.: *See—*
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Tsukamoto, Kazuyoshi; Sakauchi, Yoshiaki; Saito, Yukio; and Ushijima, Kazufumi, to Sanyo Electric Co. Automatic tuning apparatus. 3,967,057, Cl. 178-5.80A.
Tsuruishi, Yuki, to Kabushiki Kaisha Suwa Seikosha. Display device. 3,967,253, Cl. 340-173.0LM.
Tsurumi, Kotaro: *See—*
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Tummel, Harold, to Raymond Lee Organization, Inc., The, a part interest. Automatic chuck. 3,966,217, Cl. 279-59.000.
Turley, Barry Jay, to General Electric Company. Automatic sequencing scheme for reversing directions of electric traction motors. 3,967,175, Cl. 318-258.000.
Turner & Newall Limited: *See—*
Atkinson, Alan W.; and Hodgson, Brian P., 3,966,481.
Turner, Robert Bruce, to American Medical Electronics Corporation. Automatic on-off electronic switch. 3,965,743, Cl. 73-362.0AR.
Ueda, Fusao: *See—*
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Uemura, Masaru; Kuroki, Hitoshi; Echida, Nobuhiro; Kosaka, Yujiro; and Otomo, Kanji, to Toyo Soda Manufacturing Co., Ltd. Coated metal pipe. 3,967,020, Cl. 428-36.000.
Uenoyama, Masaru: *See—*
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Uht, Frank O., to Hughes, Jack, a part interest. Backwash baffle and stabilizing device for propeller driven watercraft. 3,965,838, Cl. 114-145.00A.
Ullman, Edwin F.: *See—*
Goldstein, Avram; Leute, Richard K.; and Ullman, Edwin F., 3,966,744.
Goldstein, Avram; Leute, Richard K.; and Ullman, Edwin F., 3,966,764.
Rubenstein, Kenneth E.; and Ullman, Edwin F., 3,966,556.
Ulrich, Bernhard, Jr., to Tex Trans Inc. Hydraulic power transmission and braking system for vehicles. 3,966,365, Cl. 418-29.000.
Union Carbide Corporation: *See—*
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Colomb, Henry Octave, Jr.; Trecker, David John; and Brotherton, Thomas Kemper, 3,966,797.
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United Biscuits Limited: *See—*
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Deylius, Hendrik Gerardus; Lammers, Jan Frederik; and Notenboom, Antonius Paulus, 3,967,123.
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Nelson, Norman A., 3,966,795.
Szmuszkovicz, Jacob, 3,966,736.
Yalkowsky, Samuel H., 3,966,962.

Upmeier, Hartmut; and Zimmermann, Werner-Josef, to Windmoller & Holscher. Blowhead for tubular film. 3,966,377, Cl. 425-72.00R.

Upright, Wayne N.: *See—*
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Urban, John A.: *See—*
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Vahaviolos, Sotirios John, to Western Electric Company, Inc. Method and apparatus for the real-time evaluation of welds by emitted stress waves. 3,965,726, Cl. 73-71.400.

Vaillette, Bernard D.; and Zastawny, William E., to Cincinnati Milacron-Heald Corporation. Pulley. 3,965,765, Cl. 74-230.500.

Valayil, Silvester P.: *See—*
Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., 3,966,565.

Valentine, Robert H.: *See—*
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Valle, Michael A., to Chambers Corporation. Service access control panel having electrical component array, interlock switch and fuse block. 3,967,164, Cl. 317-114.000.

Valles, Alfredo E. Multi-speed and leverage motor. 3,965,756, Cl. 74-22.00R.

Valyi, Emery I. Apparatus for making oriented hollow plastic articles. 3,966,378, Cl. 425-242.00B.

Van Allen, David E.: *See—*
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Van Brederode, Robert A.; and Steinkamp, Robert A., to Exxon Research & Engineering Co. Acrylic acid grafted polyolefins as nucleating agents for ungrafted polyolefins. 3,966,845, Cl. 260-876.00R.

Van Den Berg, Arie Pieter, to Ingenieursbureau A.P. van den Berg B.V. Apparatus for compensating movements of an apparatus for measuring or recording displacements in respect of a fixed reference surface. 3,965,728, Cl. 73-84.000.

van den Berg, Christiaan, to Big Dutchman (International) A.G. Apparatus for sorting eggs as to weight. 3,966,049, Cl. 209-121.000.

van der Burg, Willem Jacob, to Akzona Incorporated. 1,2,3,4,10,14b-Hexahydro-pyridino[1,2-a]-dibenzo[c,f]-azepine. 3,966,723, Cl. 260-247.10L.

Vanderheyden, Herman E-C, to Em. D'Hooge N.V. Drum for washer-extractor machines. 3,965,704, Cl. 68-210.000.

van der Lely, Cornelis. Mowing machines. 3,965,658, Cl. 56-192.000.

van Duyl, Willem H.: *See—*
Hendrickx, Andreas J. J.; and van Duyl, Willem H., 3,966,741.

Van Hoeven, Helene E. Bowman; Brenner, L. Martin; and Loev, Bernard, to SmithKline Corporation. 2-Alkoxy(and 2-alkoxyalkyl)-2-heterocyclic-thioacetamides for inhibiting gastric acid secretion. 3,966,945, Cl. 424-263.000.

Van Huis, Robert L., to U.S. Industries, Inc. Cooling system for poultry houses. 3,965,691, Cl. 62-157.000.

Vanlerberghe, Guy; and Sebag, Henri, to L'Oreal. Hair dyeing composition containing a non-ionic surfactant. 3,966,398, Cl. 8-11.000.

Vann, Roy R. Releasable coupling. 3,966,236, Cl. 285-39.000.

Van Poucke, Raphael Karel; and Baeyens, Freddy Carolus, to AGFA-GEVAERT N.V. Photographic silver halide emulsions containing acylacetanilide color couplers. 3,966,475, Cl. 96-55.000.

van Thillo, Hugo Johannes: *See—*
Andre, Jacques Maurice Jules; van Thillo, Hugo Johannes; Lammers, Rene Odon; Debus, Henri Robert; and Cahen, Raymond Marc, 3,966,996.

Varadhachary, Seevaram N.: *See—*
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Varian Mat GmbH: *See—*
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Varsanyi, Denis; Rathgeb, Paul; and Gass, Karl, to Ciba-Geigy Corporation. Methanesulfonic acid-2-bromoethyl ester nematocide. 3,966,961, Cl. 424-303.000.

Varta Batterie Aktiengesellschaft: *See—*
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Vass, Karoly; Karpati, Gyorgy; Szechenyi-Marton, Eva; and Simek, Ferenc, to Novex RT. Process for the production of a protein-vitamin concentrate by using yeasts from animal or vegetable fats and for its transformation into a product. 3,966,554, Cl. 195-30.000.

Vater, Wulf: *See—*
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Vaughan, David Evan William; and Edwards, Grant Campbell, to W. R. Grace & Co. Synthetic ferrierite synthesis. 3,966,883, Cl. 423-329.000.

Vaughan, Robert W.; and Jones, Robert J., to United States of America, National Aeronautics and Space Administration. Capillary flow weld-bonding. 3,967,091, Cl. 219-92.000.

Vayda, Pierre A., to Exothermic Company of Canada Limited. Sideboard construction. 3,966,167, Cl. 249-198.000.

Veatch, Frank: *See—*
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VEB Pentacon Dresden: *See—*
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VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen: *See—*
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Vecchiotti, Camillo M., to Amerace Corporation. Hollow, multilayered, cross-linked plastic structures and process for producing same. 3,966,870, Cl. 264-255.000.

Velsicol Chemical Corporation: *See—*
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Veltri, Richard D.; Fanti, Roy; and Galasso, Francis Salvatore, to United Technologies Corporation. Boron-carbon alloy tape. 3,967,029, Cl. 428-216.000.

Vennos, Spyros-Lysander N. Fluid sampling device. 3,966,439, Cl. 55-270.000.

Venuto, Paul B.: *See—*
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Vepa AG: *See—*
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Vereinigte Flugtechnische Werke-Fokker Gesellschaft mit beschrankter Haftung: *See—*
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Vervin, Jacques: *See—*
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Verwey, Jan; and Tan, Hong Sheng, to Gist-Brocades N.V. Azetidine derivatives. 3,966,738, Cl. 260-281.0GP.

Vessie, Alexander M.: *See—*
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Vetco Offshore Industries: *See—*
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Vetter, Lothar: *See—*
Riedl, Rudi; Jungnickel, Regina; Nitsch, Rainer; Lein, Werner; Vetter, Lothar; Schone, Helmut; Weisbach, Gunter; Johne, Hans; Schott, Alfred; Forster, Karl-Heinz; and Johne, Albrecht, 3,966,197.

Viamour, James Hall: *See—*
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Vickers Limited: *See—*
Greaves, Geoffrey Stuart; Deverill, Ian; and Bunce, Roger Abraham, 3,966,322.

Vignal, Maurice; and Chapuis, Henri. Method and device for thermally air-conditioning a room, a vat or the like. 3,965,694, Cl. 62-260.000.

Vigreux, Jacques; and Gromier, Andre, to Delle-Alsthom. Device for observing an equipment under tension. 3,966,297, Cl. 350-52.000.

Vinals, Joaquin: *See—*
Hall, John B.; Tseng, Ching Y.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., 3,966,799.

Vincent, Andrew W. Detent for low mass object. 3,967,293, Cl. 354-252.000.

Vind, Holger Wilhelm, to Danfoss A/S. High-duty PTC-resistor and method for its manufacture. 3,967,229, Cl. 338-13.000.

Virtanen, Pentti: *See—*
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Vitalis, Raymond, to Automobiles Peugeot; and Regie Nationale des Usines Renault. Locking mechanism in particular for a vehicle bonnet. 3,966,242, Cl. 292-19.000.

Vock, Manfred H.: *See*—
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Vofsi, David: *See*—
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Vogt, Wilhelm; Neumaier, Hubert; Schallus, Erich; and Peantek, Gunter, to Hoechst Aktiengesellschaft. Process for the manufacture of alkali metal salts of amino polycarboxylic acids. 3,966,803, Cl. 260-534.00E.

Voigt, Bernd: *See*—
Feltz, Adalbert; Opfermann, Johannes; Voigt, Bernd; and Seliger, Walter, 3,966,470.

Voigt, Gene Ray: *See*—
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vonBebenburg, Walter: *See*—
Asinger, Friedrich; Offermanns, Heribert; Gluzek, Karl-Heinz; and vonBebenburg, Walter, 3,966,752.

von Bennigsen, Gerd, to Krauss-Maffei Aktiengesellschaft. Gunnery practice method and apparatus. 3,965,582, Cl. 35-25.000.

von der Eltz, Hans-Ulrich: *See*—
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 3,966,400.

von Eickstedt, Klaus-Wolf: *See*—
Milkowski, Wolfgang; Zeugner, Horst; von Eickstedt, Klaus-Wolf; and Stuhmer, Werner, 3,966,735.

von Wiesenthal, Peter, to Heat Research Corporation. Heater for large flows at low pressure losses. 3,965,885, Cl. 126-110.00R.

Voorheis, James T. Burner gun. 3,966,123, Cl. 239-401.000.

Vorus, Sandra J.: *See*—
Mims, George P., 3,965,573.

Vos, Jerry A.: *See*—
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Maher, Philip Kenerick; and McDaniel, Carl Vance, 3,966,882.
Perdue, Richard R., 3,966,045.
Scherzer, Julius; and Maher, Philip K., 3,966,643.
Vaughan, David Evan William; and Edwards, Grant Campbell, 3,966,883.

Waaske, Heinz, to Rollei-Werke Franke & Heidecke. Miniature mirror reflex camera. 3,967,290, Cl. 354-154.000.

Wachtell, George Peter; and Jones, Edward Wilred, to Campbell Soup Company. Time temperature indicator device and method. 3,965,741, Cl. 73-344.000.

Wacks, Harvey H.; Klose, Peter H.; Ovshinsky, Stanford R.; and Hallman, Robert W., to Energy Conversion Devices, Inc. Dry process production of archival microform records from hard copy. 3,966,317, Cl. 355-19.000.

Waddell, Seid W.; and Heilman, Marlin S., to Medrad, Inc. Angiographic catheter and method of manufacture. 3,965,909, Cl. 128-348.000.

Wagener, Paul W.; and Fluet, Francis A., to Westinghouse Electric Corporation. Process control apparatus. 3,967,176, Cl. 318-603.000.

Wagensonner, Eduard; and Stenzenberger, Volkmar, to AGFA-Gevaert, A.G. Fade-over arrangement for a motion picture camera. 3,966,312, Cl. 352-91.00C.

Waghorne, Winfield Earle: *See*—
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, 3,966,890.

Wagman, Harold H. Antenna mount for vehicles. 3,967,275, Cl. 343-713.000.

Wahlco, Inc.: *See*—
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Waldrop, Thomas W.: *See*—
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Walker, Francis H.: *See*—
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Baker, Don R.; Walker, Francis H.; and Letchworth, Peter E., 3,966,809.

Walker, James H., Jr. Commercial dishwasher pre-wash station. 3,965,914, Cl. 134-104.000.

Wall, Edwin G.: *See*—
Goodwin, Henderson R.; and Wall, Edwin G., 3,965,720.

Wallace, Richard W.: *See*—
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Walling, Dennis B.: *See*—
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Walling, Ronald L.: *See*—
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Walpak Company: *See*—
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Walsh, John J., III: *See*—
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Walsh, Richard S., to Ark-Les Switch Corporation. Brush holder assembly. 3,967,148, Cl. 310-239.000.

Walton, Joe W., to Circon Corporation. Television measuring system and method. 3,967,054, Cl. 178-6.800.

Walworth, Bryant Leonidas, to American Cyanamid Company. 3,5-Cycloalkyl pyrazolium salts as fungicides. 3,966,954, Cl. 424-273.000.

Ward, Gerald G., to International Harvester Company. Flexible plow. 3,965,989, Cl. 172-310.000.

Ward, Howard E.; and Wolf, Mari A., to Joy Manufacturing Company. Pressure equalizing load cell system. 3,965,734, Cl. 73-141.00A.

Ward, James M., deceased (Ward, Sandra, surviving spouse), to Ward, Sandra. Plexiglas speakers. 3,967,065, Cl. 179-1.00E.

Ward, Sandra: *See*—
Ward, James M., deceased, 3,967,065.

Ward, Sandra, surviving spouse: *See*—
Ward, James M., deceased, 3,967,065.

Wardell, Winnifred A. Convertible multi-purpose brush assembly. 3,965,521, Cl. 15-114.000.

Warden, Fuller; and Lewis, Eugene W., to Grace Development Company. Combined amalgam carrier and dental handpiece. 3,965,578, Cl. 32-60.000.

Warkentin, Brian T., to Shade Foods, Inc. Chocolate solid wafer and method of manufacture. 3,966,997, Cl. 426-631.000.

Warley, Geoffrey Peter: *See*—
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Warner Electric Brake & Clutch Company: *See*—
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Warner-Lambert Company: *See*—
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Satzinger, Gerhard; and Herrmann, Manfred Franz, 3,966,779.
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Schoenholz, Daniel; and Weinberg, Myron S., 3,965,905.
Sircar, Jagadish C.; Zinnes, Harold; and Shavel, John, Jr., 3,966,765.

Washkewicz, Donald E.; and Busdiecker, Wayne S., to Parker-Hannifin Corporation. Hose construction and hose coupling joint. 3,966,238, Cl. 285-239.000.

Watanabe, Akinori; Tanoshima, Katsuhide; Ando, Takao; Tohama, Akira; and Nagano, Akio, to Oki Electric Industry Company, Ltd. Ultrasonic wave generator. 3,967,143, Cl. 310-8.100.

Watanabe, Isao: *See*—
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Watanabe, Masayasu, to Hokushin Electric Works, Ltd. Magnetic flowmeter. 3,965,738, Cl. 73-194.0EM.

Watari, Yoshihiko: *See*—
Nomura, Kousi; Kawazu, Satoru; Hirose, Yoshihiko; Inoue, Isao; Watari, Yoshihiko; and Kijima, Koichi, 3,966,501.

Waters, Bruce M., to Aladdin Industries, Incorporated. Odor masking and filtering ashtray. 3,966,442, Cl. 55-316.000.

Watkins, Robert Charles; Kinghan, Derek Alfred; and Humphrey, Robert Walter, to Exxon Research and Engineering Company. Lubricating oil compositions. 3,966,621, Cl. 252-42.700.

Watson, Billy Ray. Sonic fluid level control apparatus. 3,965,983, Cl. 166-250.000.

Watson, Sanders Chapman. Hydraulically actuated cutting tool. 3,966,347, Cl. 408-180.000.

Watts, Leonard, to Technicon Instruments Corporation. Method and apparatus for continuous casting of metal tubing. 3,965,965, Cl. 164-83.000.

Wavin B.V.: *See*—
Leloux, Arnoldus Willem Jan, 3,965,782.

Wayne Engineering Corporation: *See*—
Worthington, Stanley W., 3,966,096.

Wear, Robert L., to Minnesota Mining and Manufacturing Company. Phenoxy-s-triazine chain coupler for polyesterification and novel polyesters. 3,966,680, Cl. 260-47.00C.

Weatherchem Corporation: *See*—
Bittel, Patricia A., 3,966,080.

Weatherford, Richard C.: *See*—
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Weatherhead Company, The: *See*—
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Orzel, Edward S.; and Thrush, Richard G., 3,966,268.
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Webb, Norval Ellsworth, Jr., to Richardson-Merrell Inc. Pharmaceutical compositions and preparing same. 3,966,949, Cl. 424-250.000.

Webb, Robert Lee: *See*—
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Weber, Karl-Heinz; and Nohendorf, Hans, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Power supply system for extraction machine, especially a drum-cutting machine. 3,967,180, Cl. 320-13.000.

Weber, Philippe, to Agence Nationale de Valorisation de la Recherche (ANVAR). Sounding vibrometer. 3,965,725, Cl. 73-71.400.

Webster, John David; and Bowman, Henry Torrens A., to English Clays Lovering Pochin & Company Limited. Method of forming joints for protectively lined or coated metal. 3,965,555, Cl. 29-157.00R.

Wechsler, Joseph W. Bicycle gear shift. 3,965,763, Cl. 74-217.00B.

Wegner, Gunther, to Hoechst Aktiengesellschaft. Pellets. 3,965,577, Cl. 32-40.00R.

Wei, Ching-Yeu. Electronic lock. 3,967,166, Cl. 317-141.00S.

Weigele, Manfred: *See—*
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Weil-McLain Co., Inc.: *See—*
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Weil, Sanford A.: *See—*
Rush, William F.; Macriss, Robert A.; and Weil, Sanford A., 3,965,695.

Weiler, Ernest A., to Xerox Corporation. Immersion fusing. 3,965,855, Cl. 118-68.000.

Weiler, Ernest D.: *See—*
Kilbourn, Edward E.; and Weiler, Ernest D., 3,966,947.

Weinberg, Myron S.: *See—*
Schoenholz, Daniel; and Weinberg, Myron S., 3,965,905.

Weingrad, Saul W., to Pictorial Productions, Inc. Decalcomanias employed in offset transfer process. 3,967,021, Cl. 428-40.000.

Weir, Henry John, to Behn, Sheldon P.; and Behn, Robert M., Part interest to each. Apparatus for cutting, selvaging and/or folding sheet material. 3,965,831, Cl. 112-121.150.

Weir, James D. Tire buffer. 3,965,959, Cl. 157-13.000.

Weisbach, Gunter: *See—*
Riedl, Rudi; Jungnickel, Regina; Nitsch, Rainer; Lein, Werner; Vetter, Lothar; Schone, Helmut; Weisbach, Gunter; Johne, Hans; Schott, Alfred; Forster, Karl-Heinz; and Johne, Albrecht, 3,966,197.

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Weisse, Hans-Jorg: *See—*
Neeb, Karl-Heinz; Schweighofer, Werner; and Weisse, Hans-Jorg, 3,966,852.

Welton, Barry S.; and Westerman, G. Wayne, to Energy Systems, Inc. Clamp-on transducer for well unit. 3,965,736, Cl. 73-151.000.

Werner, Edward E., to Kimberly-Clark Corporation. Classifying hammermill system and method of operation. 3,966,126, Cl. 241-18.000.

Wesson, Harold R.; Brown, Lester E.; and Puckett, Gregory L., to University Engineers, Inc. Fire extinguishing method and apparatus. 3,965,988, Cl. 169-9.000.

West, Harry H.: *See—*
Brown, Lester E.; and West, Harry H., 3,965,689.

West Rand Engineering Works (Proprietary) Ltd.: *See—*
Hyslop, Ian Willoughby, 3,966,021.

Westerman, G. Wayne: *See—*
Welton, Barry S.; and Westerman, G. Wayne, 3,965,736.

Western Electric Company, Inc.: *See—*
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Westinghouse Brake & Signal Company Limited: *See—*
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Westland Aircraft Limited: *See—*
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Westphal, Kurt; Meiser, Werner; Eue, Ludwig; and Hack, Helmuth, to Bayer Aktiengesellschaft. Herbicidal agents. 3,966,715, Cl. 260-240.00A.

Westvaco Corporation: *See—*
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Wharmby, David: *See—*
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Whatley, Norman, Jr., to Lawrence Peska Associates, Inc., a part interest. Bumper mounted spring driven tire installer and remover. 3,965,956, Cl. 152-214.000.

Wheatley, Carl Franklin, Jr., to RCA Corporation. Amplifier with over-current protection. 3,967,207, Cl. 330-23.000.

Whirlpool Corporation: *See—*
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White, Eric Lawrence Casling, to EMI Limited. Radar apparatus for detecting a coherent Doppler signal in cluttered environments. 3,967,284, Cl. 343-9.000.

White, Loren Hawdon; and Young, John Herman, to United Technologies Corporation. Variable area turbine. 3,966,352, Cl. 415-115.000.

White, Mervyn A.: *See—*
Bauerle, Richard D.; Pitt, William A.; and White, Mervyn A., 3,965,938.

White, Stevan C., to Music Circuit Productions, Inc. Canopy support towers with adjustable canopy. 3,965,625, Cl. 52-29.000.

White-Westinghouse Corporation: *See—*
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Whitehouse, Ronald: *See—*
Aston, Jack Ralph; and Whitehouse, Ronald, 3,965,949.

Whitney, Maurice Aaron, to Y-TEX Corporation. Animal identification tag. 3,965,602, Cl. 40-301.000.

Whyco Chromium Company Inc.: *See—*
Hyner, Jacob; and Michelson, Robert A., 3,966,564.

Whyte, Ian A.; Ottobre, Louis G.; and McGivern, James P., to Westinghouse Electric Corporation. Distribution network power line communication system including addressable interrogation and response repeater. 3,967,264, Cl. 340-310.00A.

Wickham, David John, to Westinghouse Brake & Signal Company Limited. Rail vehicle braking system with improved brake signal propagation. 3,966,272, Cl. 303-81.000.

Widdowson, Richard E., to General Motors Corporation. Modulated throttling valve. 3,965,693, Cl. 62-217.000.

Wiechert, Rudolf: *See—*
Hofmeister, Helmut; Laurent, Henry; Wiechert, Rudolf; Annen, Klaus; and Steinbeck, Hermann, 3,966,713.

Wiegard, Klaus, to Daimler-Benz Aktiengesellschaft. Bearing support for a rotatable regenerative heat exchanger. 3,966,281, Cl. 308-202.000.

Wiesner, Robert, to Boeing Company, The. Structure for cooling helicopter tail rotor gearbox. 3,966,145, Cl. 244-17.110.

Wiessner, Manfred, to VEB Pentacon Dresden. Microfilm camera. 3,966,320, Cl. 355-73.000.

Wigfall, Douglas Mervyn, to Crompton, Nettlefold Stenman Limited. Hinges. 3,965,532, Cl. 16-149.000.

Wijffels, Joannes B.: *See—*
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Wiklund, Klas Rudolf, to AGA Aktiebolag. Device for generating a spatial reference plane. 3,966,328, Cl. 356-138.000.

Wilbur, Roger Thomas: *See—*
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Wilcox, John M.: *See—*
Bogart, James S.; and Wilcox, John M., 3,965,580.

Wilhelm, Frederick C., to Universal Oil Products Company. Dehydrogenation with a nonacidic multimetallic catalyst. 3,966,895, Cl. 260-668.00D.

Wilkinson, Lester: *See—*
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Willey Sign Company: *See—*
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William H. Rorer, Inc.: *See—*
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Williams, Albert L.: *See—*
Bridger, Robert F.; and Williams, Albert L., 3,966,620.

Williams, Charles H., to Koppers Company, Inc. Method for the production of pearlescent button blanks. 3,966,856, Cl. 264-71.000.

Williams, Clark R., to Texas Instruments Incorporated. Injection logic electronic watch having a current regulated oscillator. 3,965,666, Cl. 58-23.0BA.

Williams, Gregory P.: *See—*
Posel, John G.; Williams, Gregory P.; and Nilsen, David N., 3,966,462.

Williams, Murray John, to Borden, Inc. Method for packaging a unique cheese item. 3,966,970, Cl. 426-393.000.

Williams, Richard H.: *See—*
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Williamson, Joseph R. Convertible food service cart. 3,965,969, Cl. 165-12.000.

Williamson, Joseph Stephen, to Smith International, Inc. Mud saver valve. 3,965,980, Cl. 166-224.00R.

Willis, Thomas G., to Westinghouse Electric Corporation. Appliance timer switch assembly. 3,967,077, Cl. 200-38.0FA.

Willy, William E.; and Henrick, Clive A., to Zoecon Corporation. Spider mite control. 3,966,969, Cl. 424-343.000.

Wilson, Myrl E., to United States of America, Air Force. Inflight intravenous bottle holder. 3,966,160, Cl. 248-311.300.
Wilson, Richard Arnold; Katz, Ira; Vock, Manfred H.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Flavoring compositions and processes utilizing dithiazine compounds. 3,966,988, Cl. 426-535.000.
Windmoller & Holscher: *See*—
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Wing, Milton Silas: *See*—
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Winkler, Norlin T., to Research Corporation. Radiation shielding curtain. 3,967,129, Cl. 250-517.000.
Winkler, Robert J.; and Curran, James B. Ball drive mechanism for load supporting hanger. 3,965,824, Cl. 104-165.000.
Winskas, Andrew B. Enclosing structure for the load bed of a pickup truck. 3,966,250, Cl. 296-1.00R.
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Abel, Heinz; Dobinson, Bryan; Green, George Edward; Harris, Melvin; Stark, Bernard Peter; and Winterbottom, Kenneth, 3,967,041.
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Witonsky, Robert J.: *See*—
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Witte, Josef; and Lehnert, Gunther, to Bayer Aktiengesellschaft. Catalysts. 3,966,637, Cl. 252-429.00B.
Wittko, Joseph N.; Harding, David G.; Schneider, John J.; and Gonsalves, Joseph E., to Grumman Aerospace Corporation; and Boeing Company, The. Hammock supported fuel tank. 3,966,147, Cl. 244-135.00B.
Wize, Gary A.: *See*—
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Wolf, Mari A.: *See*—
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Wolfe, Norman Gilbert, to Celanese Coatings & Specialties Company. Powder coatings having a variegated, speckled appearance. 3,966,669, Cl. 260-37.0EP.
Wolniak, Stanley: *See*—
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Wolstenholme, Charles T.; and Sipple, Douglas E. Tool for applying retainer clips. 3,965,776, Cl. 81-3.00R.
Woltersdorf, Otto W., Jr.: *See*—
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 3,966,966.
Wolverine World Wide, Inc.: *See*—
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Woodall-Duckham, Limited: *See*—
Singleton, Frank Henry; Gosden, Derek Vernon; and Woodhouse, Graham, 3,966,876.
Woodhouse, Graham: *See*—
Singleton, Frank Henry; Gosden, Derek Vernon; and Woodhouse, Graham, 3,966,876.
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Posthuma, Albert E.; and Woodhouse, Robert C., 3,965,908.
Woodier, James G., to Bell & Howell Company. Forward-reverse projector mechanism. 3,966,313, Cl. 352-173.000.
Woods, Lee W. Measuring tape anchor. 3,965,579, Cl. 33-137.00R.
Woods, William G.; and Hunter, Don L., to United States Borax & Chemical Corporation. 3-Halo-2,6-dinitro-4-trifluoromethylaniline. 3,966,816, Cl. 260-573.000.
Woodward, Fred E., to Westvaco Corporation. Solid cleaning compositions containing C_{21} dicarboxylic acid. 3,966,628, Cl. 252-135.000.
Woodyatt, Louis R.: *See*—
Townsend, Herbert E., Jr.; Horton, James B.; and Woodyatt, Louis R., 3,966,421.
Woog, Philippe-Guy, to Les Produits Associes, SA. Apparatus for body hygiene. 3,966,359, Cl. 417-38.000.
Workman, Ruth A. Coffee substitute. 3,966,995, Cl. 426-596.000.
Worthington, Stanley W., to Wayne Engineering Corporation. Satellite refuse packer. 3,966,096, Cl. 222-389.000.
Wray, James Robert: *See*—
Brock, John O.; Davis, Marmion Dean; and Wray, James Robert, 3,965,844.
Wright, James R.: *See*—
Featherston, Richard H.; Fischer, Joseph P.; Garing, Meriwether L.; and Wright, James R., 3,966,874.
Wurlitzer Company, The: *See*—
Thomas, Howard M.; and Borowiec, Richard A., 3,965,791.
Wuthrich, Paul, to Timex Corporation. Energy cell configuration for a timepiece. 3,966,498, Cl. 136-166.000.
Wyczalek, Floyd A.; Harned, John L.; and Smith, Ora M., to General Motors Corporation. Internal combustion engine and turbosupercharger therefor with heat pipe for intake mixture heating. 3,965,681, Cl. 60-599.000.
Wysocki, Lawrence E.; and Muench, Elmer W., to Everett/Charles, Inc. Vacuum valve. 3,965,932, Cl. 137-607.000.
Xerox Corporation: *See*—
Amort, Andrew L., 3,966,318.
Bean, Lloyd F., 3,966,465.
Braun, Oskar J., 3,966,394.
Lang, John M., 3,966,319.
Levine, Leonard, 3,967,251.
Moser, Rabin, 3,965,853.
Page, Geoffrey A.; Grammatica, Steven J.; and Ewing, Joan R., 3,966,466.
Parent, Richard A., 3,966,467.
Silverberg, Morton, 3,966,199.
Taylor, Thomas N.; and Schoppe, Wayne F., 3,966,189.
Thettu, Raghulinga R.; and Xerox Corporation, 3,965,973.
Weiler, Ernest A., 3,965,855.
Yang, Frank; and Lamel, Jerome E., 3,965,862.
Y-TEX Corporation: *See*—
Whitney, Maurice Aaron, 3,965,602.
Yaguinuma, Jyusuke, to Copal Company Limited. Time switch mechanism. 3,967,078, Cl. 200-38.00R.
Yake, William H., to Design and Manufacturing Corporation. Door latch for appliances and the like. 3,966,246, Cl. 292-241.000.
Yale, Harry Louis; and Petigara, Ramesh B., to E. R. Squibb & Sons, Inc. Intermediates for certain benzothiadiazepine and benzothiadiazocine compounds. 3,966,733, Cl. 260-256.50R.
Yalkowsky, Samuel H., to Upjohn Company, The. Triacetin solutions of PGE-type compounds. 3,966,962, Cl. 424-305.000.
Yamada, Seiji: *See*—
Yata, Kotaro; and Yamada, Seiji, 3,967,056.
Yamada, Shingo, to Kabushiki Kaisha Komatsu Seisakusho. Work rest device for use in a crank pin miller. 3,965,780, Cl. 82-9.000.
Yamada, Yasutoku: *See*—
Sato, Chosei; Yamada, Yasutoku; and Takenaka, Yoshiyuki, 3,966,537.
Yamada, Yoshihisa: *See*—
Inoue, Ichizo; Oine, Toyonari; Yamada, Yoshihisa; Tani, Junichi; Ishida, Ryuichi; and Ochiai, Takashi, 3,966,731.
Yamagishi, Hidehisa; Takano, Hiroshi; and Kashiyama, Yoshitaka, to Nippon Kokan Kabushiki Kaisha. Electrolytic post-treating method of electrolytically chromate treated or metallic chromium plated steel sheet. 3,966,570, Cl. 204-140.000.
Yamaguchi, Shunsuke: *See*—
Tanaka, Toshiaki; Yamaguchi, Shunsuke; and Simowaki, Kazuharu, 3,965,962.
Yamaguchi, Tadashi; Ono, Takayuki; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, to Lion Yushi Kabushiki Kaisha (Lion Fat & Oil Co., Ltd.). Dry process for the production of plastic-coated inorganic substances. 3,967,006, Cl. 427-221.000.
Yamaha, Hatsudoki Kabushiki Kaisha: *See*—
Horiuchi, Kotaro, 3,965,513.
Yamamoto, Hisao: *See*—
Kobayashi, Kenji; Fukumaru, Toshitsugu; Mizote, Hiroyuki; Inaba, Shigeho; and Yamamoto, Hisao, 3,966,939.
Yamamoto, Kazuhiro: *See*—
Tagashira, Yoshimi; Atobe, Masaaki; and Yamamoto, Kazuhiro, 3,967,220.
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Nakai, Yoshinobu; Yamamoto, Keiji; and Nakano, Masahiro, 3,966,899.
Yamamoto, Kenichiro: *See*—
Takenaka, Shigeo; Shimizu, Hitoshi; and Yamamoto, Kenichiro, 3,966,823.
Yamamoto, Masaru, to Yashica Co., Ltd. Electric shutter operating circuits. 3,967,288, Cl. 354-60.00L.
Yamamoto, Mititaka, to Omron Tateisi Electronics Co. Liquid crystal display utilizing transmitted light. 3,966,303, Cl. 350-160.0LC.
Yamanaka, Toru: *See*—
Kato, Takashi; Yamanaka, Toru; and Komatsu, Akira, 3,966,776.
Yamanaka, Yoshiyuki: *See*—
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Yamane, Shiro: *See*—
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Yamashita, Satoshi: *See*—
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Yamazaki, Yasuo: *See*—
Kimura, Kazuo; and Yamazaki, Yasuo, 3,967,287.
Yang, Frank; and Lamel, Jerome E., to Xerox Corporation. Xerographic development system. 3,965,862, Cl. 118-637.000.
Yanick, Nicholas S.: *See*—
Colliopoulos, John A.; and Yanick, Nicholas S., 3,966,632.
Yariv, Amnon, to California Institute of Technology. X-ray laser with a single crystal waveguide structure. 3,967,213, Cl. 331-94.50C.
Yarnall, Joseph P.: *See*—
Schramm, Harold J., deceased; McCullough, John R.; and Yarnall, Joseph P., 3,966,854.
Yashica Co., Ltd.: *See*—
Yamamoto, Masaru, 3,967,288.
Yasui, Robert K.; and Berman, Paul A., to United States of America, Administrator, National Aeronautics and Space Administration. Solar cell grid patterns. 3,966,499, Cl. 136-206.000.
Yasuike, Akio; Shibuya, Takehiro; Toyouchi, Kaoru; and Imai, Susumu, to Asahi-Dow Limited. Injection molding apparatus for forming a composite, foam-skin, article. 3,966,372, Cl. 425-4.00R.
Yata, Kotaro; and Yamada, Seiji, to Minolta Camera Kabushiki Kaisha. Automatic focusing apparatus. 3,967,056, Cl. 178-7.200.
Yatsuo, Tsutomu; Kamei, Tatsuya; Ogawa, Takuzo; and Tanaka, Tomoyuki, to Hitachi, Ltd. Semiconductor controlled rectifier. 3,967,308, Cl. 357-38.000.

Yeda Research & Development Co. Ltd.: *See*—
Levy, Moshe; Vofsi, David; Daren, Stephen; and Cohen, Ella, 3,966,831.
Mazur, Yehuda; Freeman, Dalia; and Acher, Aureliu J., 3,966,777.
Yevick, George J. Multiple function microfiche and film recording and viewing system. 3,967,289, Cl. 354-125.000.
Yoda, Tohru: *See*—
Makihara, Chiharu; and Yoda, Tohru, 3,967,050.
Yoichizono, Kenji: *See*—
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Yokomichi, Isao: *See*—
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Toki, Tadaaki; and Someya, Shinzo, 3,966,453.
Yoshida, Yoshiaki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; and Daiwa Boseki Kabushiki Kaisha. Thread drawoff tube for an open-end spinning unit. 3,965,661, Cl. 57-58.890.
Yoshimura, Katsuaki: *See*—
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Young, J. Ridgely, to Brownlee, Kay Melinda. Directional signal. 3,967,240, Cl. 340-73.000.
Young, John Herman: *See*—
White, Loren Hawdon; and Young, John Herman, 3,966,352.
Young, Jonathan D.; and Caldecott, Ross, to Ohio State University, The. Underground pipe detector. 3,967,282, Cl. 343-5.0NA.
Young, Robert A., to American Micro-Systems, Inc. Liquid crystal cell with improved alignment. 3,966,305, Cl. 350-160.0LC.
Yuan, Sun-Shine: *See*—
Bodor, Nicolae S.; and Yuan, Sun-Shine, 3,966,749.
Yurcek, Jean Marie: *See*—
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Zaenkert, Fred A., to Cincinnati Butchers' Supply Co., The. Sludge elevator for fluid clarification system. 3,966,617, Cl. 210-519.000.
Zagorski, Edward J.: *See*—
McCain, William B.; Cosgrove, James F.; and Zagorski, Edward J., 3,966,185.
Zahnradfabrik Friedrichshafen AG: *See*—
Binger, Bernhard, 3,966,005.
Zaikonnikova, Irina Vitalievna: *See*—
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Zalokar, Robert F.: *See*—
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Zalta, Maurice: *See*—
Mayer, Salvador Escobar, Sr., 3,966,183.
Zambolin, Adriano, to Ing. C. Olivetti & C., S.p.A. Equipment for handling different forms for an accounting machine. 3,966,037, Cl. 197-133.00R.
Zastawny, William E.: *See*—
Vaillette, Bernard D.; and Zastawny, William E., 3,965,765.
Zboril, Josef, to BBC Brown Boveri & Company Limited. Process for the manufacture of anti-abradant elements. 3,966,511, Cl. 148-127.000.
Zecher, Wilfried: *See*—
Merten, Rudolf; Lewalter, Jurgen; and Zecher, Wilfried, 3,966,683.
Zeeh, Bernd: *See*—
Mangold, Dietrich; Zeeh, Bernd; and Pommer, Ernst-Heinrich, 3,966,750.
Zeger, Andrew E., to Magnavox Company, The. Self-phasing array with a time-shared processor. 3,967,279, Cl. 343-117.00A.
Zeiss, John C.: *See*—
Knapp, Julius Z.; and Zeiss, John C., 3,966,332.
Zemanek, Joseph, Jr.: *See*—
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Zilberman, Leonid Borisovich: *See*—
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Zimakova, Irina Evgenievna: *See*—
Novikov, Sergei Sergeevich; Khmelnitsky, Lenor Ivanovich; Lebedev, Oleg Vasilievich; Epishina, Lia Vladimirovna; Suvorova, Ljudmila Ivanovna; Lapshina, Lidia Vasilievna; Krylov, Valery Dmitrievich; Zaikonnikova, Irina Vitalievna; Zimakova, Irina Evgenievna; Chudnovsky, Vladimir Sergeevich; Babichev, Viktor Andreevich; and Avdonina, Nina Alexandrovna, 3,966,742.
Zimmerman, Gary Lee: *See*—
Little, David Murray; and Zimmerman, Gary Lee, 3,966,290.
Zimmerman, Richard Henry: *See*—
Ceresa, Myron; and Zimmerman, Richard Henry, 3,967,162.
Zimmermann, Werner-Josef: *See*—
Upmeier, Hartmut; and Zimmermann, Werner-Josef, 3,966,377.
Zinnes, Harold: *See*—
Sircar, Jagadish C.; Zinnes, Harold; and Shavel, John, Jr., 3,966,765.
Zirconal Processes Limited: *See*—
Emblem, Harold Garton; and Sargeant, Graham Kenwood, 3,967,003.
Zobbi, Robert G.: *See*—
Dietz, George, Jr.; Skomoroski, Robert M.; and Zobbi, Robert G., 3,966,880.
Zoecon Corporation: *See*—
Willy, William E.; and Henrick, Clive A., 3,966,969.
Zonge, Kenneth L. Method using induced polarization for ore discrimination in disseminated earth deposits. 3,967,190, Cl. 324-1.000.
Zorev, Nikolai Nikolaevich: *See*—
Alexandrov, Nikolai Nikitievich; Zorev, Nikolai Nikolaevich; Krapukhin, Viktor Mikhailovich; Krotov, Viktor Vasilievich; Kryanin, Ivan Romanovich; Milman, Boris Samoilovich; Semenov, Pavel Vladimirovich; Sokolov, Nikolai Anatolievich; and Tinyakov, Viktor Gurievich, 3,965,968.
Zuckerberg, Harry; and Kukers, William. Air sterilizing compressor system. 3,966,407, Cl. 21-74.00R.
Zuleeg, Rainer, to McDonnell Douglas Corporation. Multichannel junction field-effect transistor and process. 3,967,305, Cl. 357-3.000.
Zurfluh, Rene: *See*—
Chodnekar, Madhukar Subraya; Loeliger, Peter; Pfiffner, Albert; Schwieter, Ulrich; Suchy, Milos; and Zurfluh, Rene, 3,966,780.
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF JUNE, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Can Company: *See—*
Mueller, David Charles, Re. 28,882.

Colorflo Limited: *See—*
Farrow, Harold Frederick, Re. 28,880.

Cotter, William P.; Lloyd, Norman E.; Hinman, Charles W., deceased; and by Deitchler, Roy W., administrator, to Standard Brands Incorporated. Method for isomerizing glucose syrups. Re. 28,885, Cl. 195-31.00F.

Deitchler, Roy W., administrator: *See—*
Cotter, William P.; Lloyd, Norman E.; Hinman, Charles W., deceased; and Deitchler, Roy W., administrator, Re. 28,885.

Farr, Glyn P. R., to Girling Limited. Brake adjusters. Re. 28,881, Cl. 188-196.00D.

Farrow, Harold Frederick, to Colorflo Limited. Printing machines feed mechanism. Re. 28,880, Cl. 101-366.000.

Girling Limited: *See—*
Farr, Glyn P. R., Re. 28,881.

Hagino, Hiroshi: *See—*
Nakayama, Kiyoshi; and Hagino, Hiroshi, Re. 28,886.

Hinman, Charles W., deceased: *See—*
Cotter, William P.; Lloyd, Norman E.; Hinman, Charles W., deceased; and Deitchler, Roy W., administrator, Re. 28,885.

Hooker Chemicals & Plastics Corporation: *See—*
Jack, Walter Q.; and Johnson, Loyd V., Re. 28,884.
Jack, Walter Q.; and Johnson, Loyd V., Re. 28,887.

Jack, Walter Q.; and Johnson, Loyd V., to Hooker Chemicals & Plastics Corporation. Woodpulp bleaching process. Re. 28,884, Cl. 162-66.000.

Jack, Walter Q.; and Johnson, Loyd V., to Hooker Chemicals & Plastics Corporation. Sequential bleaching of kraft pulp with chlorine dioxide followed by chlorine. Re. 28,887, Cl. 162-66.000.

Johnson, Loyd V.: *See—*
Jack, Walter Q.; and Johnson, Loyd V., Re. 28,884.
Jack, Walter Q.; and Johnson, Loyd V., Re. 28,887.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Nakayama, Kiyoshi; and Hagino, Hiroshi, Re. 28,886.

Lloyd, Norman E.: *See—*
Cotter, William P.; Lloyd, Norman E.; Hinman, Charles W., deceased; and Deitchler, Roy W., administrator, Re. 28,885.

Material Distributors Corporation: *See—*
Willdorf, Michael E., Re. 28,883.

Matsushita Electric Industrial Co., Ltd.: *See—*
Mori, Fumiko, Re. 28,888.

Mori, Fumiko, to Matsushita Electric Industrial Co., Ltd. Cooking time adjusting arrangement for use in electronic oven. Re. 28,888, Cl. 219-10.55B.

Mueller, David Charles, to American Can Company. Dispensing carton. Re. 28,882, Cl. 229-44.0CB.

Nakayama, Kiyoshi; and Hagino, Hiroshi, to Kyowa Hakko Kogyo Co., Ltd. Method for preparing cytidine diphosphate choline. Re. 28,886, Cl. 195-28.00N.

Standard Brands Incorporated: *See—*
Cotter, William P.; Lloyd, Norman E.; Hinman, Charles W., deceased; and Deitchler, Roy W., administrator, Re. 28,885.

Verest, Ralph W. Tractor trailer fifth-wheel release tool. Re. 28,879, Cl. 7-1.00G.

Willdorf, Michael E., to Material Distributors Corporation. Process for producing solar control window. Re. 28,883, Cl. 156-71.000.

LIST OF PLANT PATENTEES

Conard-Pyle Co., The: *See—*
Meilland, Marie-Louise, A. A., and Richardier. 3,926.

Freimann, Raymond C., to Stark Brothers Nurseries & Orchards Co. Apricot tree. 3,927, 6–29–76, Cl. 39.

Goldsmith Seeds Inc.: *See—*
Hope, Claude, and Murillo. 3,930.

Hope, Claude, and R. A. M. Murillo, to Goldsmith Seeds Inc. Impatiens plant. 3,930, 6–29–76, Cl. 68.

Johnson, Louis F., deceased, by Margaret M. Johnson, administratrix, to Stark Brothers Nurseries & Orchards Co. Pear tree. 3,928, 6–29–76, Cl. 36.

Johnson, Margaret M.: *See—*
Johnson, Louis F., and M. M. 3,928.

Meilland, Alain A.: *See—*
Meilland, Marie-Louise, A. A., and Richardier. 3,926.

Meilland, Marie-Louise, A. A., and M. M. Richardier to The Conard-Pyle Co. Rose plant-meinastur variety. 3,926, 6–29–76, Cl. 20.

Murillo, Rafael A. M.: *See—*
Hope, Claude, and Murillo. 3,930.

Olmo, Harold P., to The Regents of the University. Grapevine. 3,929, 6–29–76, Cl. 47.

Regents of the University, The: *See—*
Olmo, Harold P. 3,929.

Richardier, Michele M.: *See—*
Meilland, Marie-Louise, Meilland, A. A., and Richardier. 3,926.

Stark Brothers Nurseries & Orchards Co.: *See—*
Freimann, Raymond C. 3,927.
Johnson, Louis F., and M. M. 3,928.

LIST OF DESIGN PATENTEES

Adkinson, Joseph E. Country French style sofa. 240,342, 6–29–76, Cl. D6—63.

Adkinson, Joseph E. Sofa. 240,344, 6–29–76, Cl. D6—63.

Askew, Aubrey, to Dunlop Ltd. Shoe sole and heel unit. 240,340, 6–29–76, Cl. D6—320.

Bennett, Eva J. Team standing display. 240,365, 6–29–76, Cl. D34—5.

Bruce, Robert A.: *See—*
Chadima, George E., Jr., and Bruce. 240,360.

Button, Dennis K. Wristwatch strap. 240,368, 6–29–76, Cl. D45—4.

Callahan, Matthew F., to Monastery Furniture Mfg. Seat or similar article. 240,345, 6–29–76, Cl. D6—71.

Carrier Corp.: *See—*
Hoyle, Walter W., Hayes, and Tobin. 240,357.

Chadbourne, Gilbert R., to Keyes Fibre Co. Packaging tray for cans or the like. 240,355, 6–29–76, Cl. D9—219.

Chadima, George E., Jr., and R. A. Bruce, to Norand Corp. Acoustic coupled remote date entry terminal. 240,360, 6–29–76, Cl. D26—5.

Coffy, Marie J., to Saint-Gobain-Desjonqueres. Combined bottle and stopper. 240,352, 6–29–76, Cl. D9—118.

Cook, Raymon W., to Ray Cook Golf Putters, Inc. Gulf putter head. 240,366, 6–29–76, Cl. D34—5.

Cope, James R. Handle gripping sleeve for a tennis racket or the like. 240,367, 6–29–76, Cl. D34—5.

Cragin, Richard O., to Gorham, a division of Textron Inc. Article of flatware. 240,350, 6–29–76, Cl. D7—137.

Cruise, Nay E. Fishing lure. 240,358, 6–29–76, Cl. D22—27

Dunlop Ltd.: *See—*
Askew, Aubrey. 240,340.

Edwards, Richard T. Compartmented food entainer. 240,353, 6–29–76, Cl. D9—183.

Finkelstein, William, to Universal Security Instruments, Inc. Box for smoke detectors. 240,354, 6–29–76, Cl. D9—197.

Generalis, Alexander L., M. C. Roberto, D. A. White, and D. S. Sheftelman. Bicycle hanger. 240,351, 6–29–76, Cl. D8—235.

Ghelli, Amleto. Set of chessmen. 240,364, 6–29–76, Cl. D34—5.

Gorham, a division of Textron Inc.: *See—*
Cragin, Richard O. 240,350.

Hayes, Richmond S.: *See—*
Hoyle, Walter W., Hayes, and Tobin. 240,357.

Hoshino, Kunio: *See—*
Kowamura, Ken, and Hoshino. 240,369.

Hoyle, Walter W., R. S. Hayes, and C. L. Tobin, to Carrier Corp. Casing for refrigeration system condensing units or the like. 240,357, 6–29–76, Cl. D23—139.

Johnson, Richard A., and D. E. Scott. Cathode ray oscilloscope or the like. 240,356, 6–29–76, Cl. D10—76.

Kaplan, Burton H., to Rowe Furniture Corp. Furniture arm or similar article. 240,346, 6–29–76, Cl. D6—194.

Kawamura, Ken, and K. Hoshino, to Matsushita Electric Industrial Co., Ltd. Radio receiver. 240,369, 6–29–76, Cl. D56—4.

Keyes Fibre Co.: *See—*
Chadbourne, Gilbert R. 240,355.

Laakkonen, Launo: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
Kawamura, Ken, and Hoshino. 240,369.

Monastery Furniture Mfg.: *See—*
Callahan, Matthew F. 240,345.

Moore, Franklin, Jr. Table for food products display. 240,343, 6–29–76, Cl. D6—20.
Najjar, William K. Combined toothbrush and dental floss holder. 240,341, 6–29–76, Cl. D4—18.
Norand Corp.: *See*—
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Purhonen, Matti, and L. Laakkonen, to Temet Oy. Motor-driven air-intake and blast aggregate for public shelters. 240,359, 6–29–76, Cl. D23—162.
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Rowe Furniture Corp.: *See*—
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Schoblom, Svante. Chair. 240,348, 6–29–76, Cl. D6—31.
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Vick, Edward L., and Smith. 240,347.
Temet Oy: *See*—
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Tobin, Curtis L.: *See*—
Hoyle, Walter W., Hayes, and Tobin. 240,357.
U.S. Philips Corp.: *See*—
Van de Poel, Rebertus. 240,361.
Waagen, Jozef J. 240,349.
Universal Security Instruments, Inc.: *See*—
Finkelstein, William. 240,354.
Van de Poel, Rebertus, to U.S. Philips Corp. Dictating machine. 240,361, 6–29–76, Cl. D26—14.
Vick, Edward L., and A. E. Smith. Snatch block. 240,347, 6–29–76, Cl. D8—216.
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ISSUED JUNE 29, 1976

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CLASS 2
24 3,965,486
69.5 3,965,487
161A 3,965,488

CLASS 3
1.91 3,965,489
1.913 3,965,490
12.8 3,965,491

CLASS 4
18R 3,965,493
79 3,965,492
145 3,965,494
182 3,965,495
185B 3,965,496
227 3,965,497

CLASS 5
6 3,965,498
13 3,965,499
68 3,965,500
90 3,965,501
111 3,965,502
334C 3,965,504
334R 3,965,503
343 3,965,505
345R 3,965,506
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CLASS 6
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CLASS 7
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CLASS 8
2.5A 3,966,396
10 3,966,397
11 3,966,398
26 3,966,399
82 3,966,400
94.11 3,966,401
94.27 3,966,402
127.51 3,966,403
3,966,404
149.1 3,965,511
168A 3,966,405
179 3,966,406

CLASS 9
8R 3,965,512
25 3,965,513
310E 3,965,514

CLASS 12
114.6 3,965,515
142RS 3,965,517
142V 3,965,516

CLASS 13
6 3,967,046
3,967,047
35 3,967,048

CLASS 15
104.93 3,965,518
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104.94 3,965,520
114 3,965,521
250.04 3,965,522
302 3,965,523
308 3,965,524
373 3,965,525
377 3,965,526
396 3,965,527

CLASS 16
110R 3,965,528
121 3,965,529
130 3,965,530
140 3,965,531
149 3,965,532
189 3,965,533

CLASS 17
1G 3,965,535
11 3,965,534
25 3,965,536
42 3,965,537

CLASS 20
7 3,965,510

CLASS 21
74R 3,966,407
87 3,966,408

CLASS 23
230B 3,966,410
230R 3,966,409
3,966,411
232R 3,966,412
253TP 3,966,414
253R 3,966,413
259.1 3,966,415
273SP 3,966,416
283 3,966,417
284 3,966,418
288F 3,966,419
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CLASS 24
16PB 3,965,538
71.3 3,965,539
84R 3,965,540
122.6 3,965,541
136R 3,965,542
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3,965,544
186 3,965,545
243K 3,965,546

CLASS 28
1.3 3,965,547
1.7 3,965,548

CLASS 29
1.22 3,965,549
6.2 3,965,550
25.42 3,965,552
33D 3,965,551
96 3,965,553
149.5B 3,965,554
157R 3,965,555
182.5 3,966,421
182.7 3,966,422
3,966,423
191.2 3,966,424
191.6 3,966,425
196.2 3,966,426
200J 3,965,556
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203DT 3,965,559
203MW 3,965,558
208R 3,965,560
211R 3,965,561
407 3,965,562
427 3,965,563
434 3,965,564
446 3,965,565
451 3,965,566
574 3,965,567
583 3,965,568

CLASS 30
29.5 3,965,569
90.1 3,965,570
90.2 3,965,571
102 3,965,572
124 3,965,573
3,965,574
294 3,965,575

CLASS 32
32 3,965,576
40R 3,965,577
60 3,965,578

CLASS 33
137R 3,965,579
143M 3,965,580

CLASS 34
1 3,965,581

CLASS 35
25 3,965,582
55 3,965,583

CLASS 36
7.3 3,965,586
122 3,965,584
125 3,965,585

CLASS 37
8 3,965,587

CLASS 38
103 3,965,588

CLASS 40
19 3,965,590
21C 3,965,589
21R 3,965,591
28.1 3,965,592
32 3,965,593
104.02 3,965,594
104.18 3,965,595
125N 3,965,596
130D 3,965,597
135 3,965,598
152 3,965,599
152.1 3,965,600
155 3,965,601
301 3,965,602

CLASS 42
65 3,965,603
69B 3,965,604

CLASS 43
1 3,965,605
21.2 3,966,151
42.16 3,965,606
87 3,965,607
110 3,965,608
131 3,965,609

CLASS 44
10H 3,966,427
62 3,966,428
68 3,966,429

CLASS 46
17 3,965,610
74B 3,965,611
211 3,965,612
238 3,965,613

CLASS 47
2 3,965,615
14 3,965,614
34R 3,965,616
58 3,965,617

CLASS 48
180R 3,966,430
197R 3,966,431

CLASS 49
103 3,965,618

CLASS 51
58 3,965,619
164 3,965,620
165R 3,965,622
165.71 3,965,621
281R 3,965,623
308 3,966,432

CLASS 52
28 3,965,624
29 3,965,625
79 3,965,626
3,965,627
115 3,965,628
221 3,965,629
224 3,965,630
232 3,965,631
3,965,632
309 3,965,633
403 3,965,634
434 3,965,635
496 3,965,636
596 3,965,637
616 3,965,638
629 3,965,639
704 3,965,640
738 3,965,641
753K 3,965,958

CLASS 53
28 3,965,642
29 3,965,643
3,965,644
32 3,965,645
112B 3,965,646
117 3,965,647
126 3,965,648
127 3,965,649
166 3,965,650
183 3,965,651
3,965,652
187 3,965,653
189 3,965,654
225 3,965,655
282 3,965,656

CLASS 55
66 3,966,433
96 3,966,434
131 3,966,435
147 3,966,436
219 3,966,437
238 3,966,438
270 3,966,439
274 3,966,440
290 3,966,441
316 3,966,442
337 3,966,443
356 3,966,444

CLASS 56
10.2 3,965,657
192 3,965,658
313 3,965,659
344 3,965,660

CLASS 57
58.89 3,965,661
77.33 3,965,662
140BY 3,965,663
157R 3,965,664

CLASS 58
23BA 3,965,665
3,965,666
28A 3,965,667
126E 3,965,668
146 3,965,669

CLASS 59
79R 3,965,670
80 3,965,671

CLASS 60
39.14 3,965,673
39.18B 3,965,674
3,965,675
39.5 3,965,672
255 3,965,676
277 3,965,677
305 3,965,678
357 3,965,680
398 3,965,679
420 3,965,682
599 3,965,681
641 3,965,683
660 3,965,684

CLASS 61
11 3,965,685
3,965,686
13 3,966,233
46 3,965,687
50 3,965,688

CLASS 62
3,965,689
58 3,966,445
121 3,965,690
157 3,965,691
193 3,965,692
217 3,965,693
260 3,965,694
271 3,965,695
324 3,965,696
402 3,965,697
454 3,965,698

CLASS 64
1V 3,965,699
18 3,965,700
21 3,965,701

CLASS 65
2 3,966,446
40 3,966,447
43 3,966,448
3,966,449

CLASS 66
173 3,965,702
193 3,965,703

CLASS 68
210 3,965,704

CLASS 70
58 3,965,705
68 3,965,706
120 3,965,707
166 3,965,708
227 3,965,709
452 3,965,710

CLASS 71
15 3,966,450
91 3,966,451
3,966,452
105 3,966,453

CLASS 72
32 3,965,714
39 3,965,711
42 3,965,712
146 3,965,713
342 3,965,715
356 3,965,716
364 3,965,717
405 3,965,718
410 3,965,719
458 3,965,720
462 3,965,721

CLASS 73
53 3,965,723
59 3,965,722
64.2 3,965,724
71.4 3,965,725
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81 3,965,727
84 3,965,728
90 3,965,729
118 3,965,730
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3,965,732
133R 3,965,733
141A 3,965,734
3,965,735
151 3,965,736
160 3,965,737
194EM 3,965,738
194E 3,965,739
194R 3,965,740
344 3,965,741
356 3,965,742
362AR 3,965,743
393 3,965,744
398AR 3,965,745
398C 3,965,746
421.5A 3,965,748
421.5R 3,965,747
3,965,749
425.4R 3,965,750
432R 3,965,751
457 3,965,752
504 3,965,753

CLASS 74
6 3,965,754
10R 3,965,755
22R 3,965,756
30 3,965,757
41 3,965,758
89.14 3,965,759
3,965,760
89.15 3,965,761
206 3,965,762
217B 3,965,763
221 3,965,764
230.17A 3,965,766
230.24 3,965,767
230.5 3,965,765
242.11R 3,965,768
245R 3,965,769
471XY 3,965,770
479 3,965,771
586 3,965,772
804 3,965,773
805 3,965,774
827 3,965,775

CLASS 75
.5BA 3,966,454
21 3,966,455
41 3,966,456
42 3,966,457
84 3,966,459
84.4 3,966,460
84.5 3,966,458
101BE 3,966,462
101R 3,966,461
108 3,966,463
173R 3,966,464

CLASS 81
3R 3,965,776
5.1R 3,965,777
52.4R 3,965,778
416 3,965,779

CLASS 82
9 3,965,780

CLASS 83
13 3,965,781
15 3,965,782
88 3,965,783
157 3,965,784
316 3,965,785
346 3,965,786
478 3,965,787
745 3,965,788

CLASS 84
1.24 3,965,789
1.27 3,965,790
343 3,965,791

CLASS 85
7 3,965,792
41 3,965,793
77 3,965,794

CLASS 89
1.5F 3,965,795

CLASS 90
13R 3,965,796

CLASS 91
32 3,965,797
172 3,965,798
220 3,965,799
336 3,965,800
351 3,965,801

CLASS 92
84 3,965,802

CLASS 93
36M 3,965,803
51HW 3,965,804

CLASS 96
1PS 3,966,465
1.2 3,966,466
1.4 3,966,467
1.5 3,966,468
3,966,469
3,966,470
3,966,471
33 3,966,472
36 3,966,473
36.1 3,966,474
55 3,966,475
107 3,966,476
124 3,966,477

CLASS 98
115SB 3,965,805

CLASS 99
331 3,965,806
375 3,965,807
419 3,965,808
492 3,965,809
581 3,965,810

CLASS 100
4 3,965,811
39 3,965,812
99 3,965,813
245 3,965,814

CLASS 101
91 3,965,815
115 3,965,816
120 3,965,817
218 3,965,818
350 3,965,819
366 Re.28,880
426 3,965,820

CLASS 102
79 3,965,821

CLASS 104
7B 3,965,822
91 3,965,823
165 3,965,824
275 3,965,967

CLASS 105
224.1 3,965,825

CLASS 106
15FP 3,966,478
38.5R 3,966,479
40R 3,966,480
54 3,966,481
64 3,966,482
171 3,966,483
287R 3,966,484

3,966,485
3,966,486
307 3,966,487
308Q 3,966,488

CLASS 108
152 3,965,826

CLASS 109
3 3,965,827

CLASS 110
8R 3,965,828
22R 3,965,829

CLASS 112
121.11 3,965,830
121.15 3,965,831
262 3,965,832
265 3,965,833

CLASS 113
120Y 3,965,834

CLASS 114
42 3,965,835
66.5R 3,965,836
125 3,965,837
144B 3,965,840
145A 3,965,838
3,965,839
230 3,965,841
235R 3,965,842

CLASS 115
19 3,965,843
41R 3,965,844
42 3,965,845
64 3,965,846

CLASS 116
114W 3,965,847
114.5 3,965,848
3,965,849
124.2R 3,965,850

CLASS 118
1 3,965,851
8 3,965,852
60 3,965,853
66 3,965,854
68 3,965,855
202 3,965,856
405 3,965,857
417 3,965,858
428 3,965,859
612 3,965,860
637 3,965,861
3,965,862

CLASS 119
1 3,965,863
18 3,965,864
19 3,965,865
29 3,965,866
52AF 3,965,867
52R 3,965,868

CLASS 123
8.45 3,965,869
23 3,965,870
25B 3,965,871
32SP 3,965,881
32C 3,965,872
52M 3,965,873
117A 3,965,874
139AY 3,965,875
139E 3,965,877
139 3,965,876
148E 3,965,878
148P 3,965,879
196R 3,965,880

CLASS 124
18 3,965,882
24R 3,965,883
35A 3,965,884

CLASS 126
110R 3,965,885
121 3,965,886
271 3,965,887

CLASS 127
46A 3,966,489

CLASS 128
2F 3,965,889
2W 3,965,888
20 3,965,890
130 3,965,891
142.3 3,965,892
145.8 3,965,893
194 3,965,894
214C 3,965,895
214R 3,965,896
3,965,897
220 3,965,898
225 3,965,899
275 3,965,900
276 3,965,901
3,965,902
3,965,903
284 3,965,904
285 3,965,905
287 3,965,906
296 3,965,907
303R 3,965,908
348 3,965,909
349R 3,965,910

CLASS 131
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CLASS 133
1R 3,965,912
8R 3,965,913

CLASS 134
104 3,965,914

CLASS 135
1R 3,965,915

CLASS 136
6FS 3,966,492
6LF 3,966,491
6LN 3,966,490
20 3,966,493
24 3,966,494
27 3,966,495
86A 3,966,496
90 3,966,497
166 3,966,498
206 3,966,499
232 3,966,500

CLASS 137
15 3,965,916
38 3,965,917
83 3,965,918
107 3,965,919
115 3,965,920
117 3,965,921
218 3,965,922
315 3,965,923
344 3,965,924
451 3,965,925
460 3,965,927
499 3,965,928
503 3,965,929
512.1 3,965,926
525 3,965,930
561A 3,965,931
607 3,965,932
610 3,965,933
624.14 3,965,934
625.17 3,965,936
625.4 3,965,935
625.47 3,965,937

CLASS 138
107 3,965,938

CLASS 139
48 3,965,939
192 3,965,940
207 3,965,941
384R 3,965,942
421 3,965,943
3,965,944

CLASS 141
27 3,965,945
51 3,965,946
207 3,965,947

CLASS 144
3R 3,965,948
28.71 3,965,949

CLASS 145
52 3,965,950

CLASS 148
1.5 3,966,501
6 3,966,502
9.5 3,966,503
3,966,504
11.5A 3,966,506
11.5R 3,966,505
12R 3,966,507
15 3,966,508
16 3,966,509
105 3,966,510
127 3,966,511
174 3,966,512
175 3,966,513
187 3,966,514
188 3,966,515

CLASS 149
23 3,965,951
60 3,966,516

CLASS 150
3 3,965,952
3,965,953
52G 3,965,955

CLASS 151
5 3,965,954

CLASS 152
214 3,965,956
400 3,965,957

CLASS 156
7 3,966,517
64 3,966,518
71 Re.28,883
73.1 3,966,519
3,966,520
78 3,966,521
148 3,966,522
169 3,966,523
182 3,966,524
195 3,966,525
224 3,966,526
250 3,966,527
293 3,966,528
300 3,966,529
308 3,966,530
329 3,966,531
344 3,966,532
380 3,966,533
384 3,966,534
394 3,966,535
401 3,966,536

CLASS 157
13 3,965,959

CLASS 159
2R 3,966,537
3,966,538
47R 3,966,539
3,966,541

CLASS 160
295 3,965,960

CLASS 162
13 3,966,540
57 3,966,542
66 Re.28,884
Re.28,887
158 3,966,543
199 3,966,544
264 3,966,545
293 3,966,546

CLASS 164
40 3,965,961
55 3,965,962
60 3,965,963
83 3,965,964
3,965,965
213 3,965,966
287 3,965,968

CLASS 165
12 3,965,969
32 3,965,970
39 3,965,971
45 3,965,972
86 3,965,973
89 3,965,974
108 3,965,975
175 3,965,976

CLASS 166
88 3,965,977
113 3,965,978
117.5 3,965,979
224R 3,965,980
228 3,965,981
249 3,965,982
250 3,965,983
270 3,965,984
275 3,965,985
292 3,965,986
315 3,965,987

CLASS 169
9 3,965,988

CLASS 172
310 3,965,989
375 3,965,990
376 3,965,991

CLASS 173
127 3,965,992

CLASS 174
53 3,967,049
135 3,967,050
143 3,967,051

CLASS 175
4.6 3,965,993
52 3,965,994
57 3,965,995
3,965,996
65 3,965,997
209 3,965,998
238 3,965,999

CLASS 176
11 3,966,547
37 3,966,548
65 3,966,549
78 3,966,550

CLASS 177
1 3,966,000
128 3,966,001
136 3,966,002
211 3,966,003

CLASS 178
5.8A 3,967,057
6 3,967,052
6.8 3,967,053
3,967,054
7.1 3,967,055
7.2 3,967,056
58A 3,967,059
58R 3,967,058
69.5R 3,967,060
3,967,061
3,967,062

CLASS 179
1GQ 3,967,063
1E 3,967,065
1P 3,967,064
1.5R 3,967,066
3,967,067
6R 3,967,068
15AT 3,967,070
15BT 3,967,069
18ES 3,967,071
18FH 3,967,073
3,967,074
18J 3,967,072
98 3,967,075
99 3,967,076

CLASS 180
5R 3,966,004
6.44 3,966,005
32 3,966,006
34 3,966,007
75 3,966,008
89A 3,966,009
103BF 3,966,010
105E 3,966,011
127 3,966,012

CLASS 181
33G 3,966,013
35A 3,966,014
56 3,966,015
57 3,966,016

CLASS 182
18 3,966,017
103 3,966,018

CLASS 184
7D 3,966,019
11R 3,966,020
56R 3,966,021

CLASS 187
12 3,966,022

CLASS 188
1B 3,966,023
71.2 3,966,024
72.5 3,966,025
73.5 3,966,026
182 3,966,027
196BA 3,966,028
196D Re.28,881
218XL 3,966,029
318 3,966,030

CLASS 192
3.3 3,966,031
3,966,032

CLASS 194
1R 3,966,033
100A 3,966,034

CLASS 195
6 3,966,551
28N Re.28,886
28R 3,966,553
30 3,966,554
31F Re.28,885
63 3,966,556
66R 3,966,555
80R 3,966,557
103.7 3,966,896
139 3,966,552
3,966,558

CLASS 196
111 3,966,559

CLASS 197
1R 3,966,035
82 3,966,036
133R 3,966,037

CLASS 198
20R 3,966,038
21 3,966,039
288 3,966,040

CLASS 200
38FA 3,967,077
38R 3,967,078
61.45R 3,967,079
61.64 3,967,080
67PK 3,967,081
82D 3,967,082
237 3,967,083
275 3,967,084
302 3,967,085
328 3,967,086

CLASS 201
32 3,966,560

CLASS 202
117 3,966,561
173 3,966,562
228 3,966,563

CLASS 204
43S 3,966,564
52R 3,966,565
73R 3,966,566
105R 3,966,567
3,966,568
108 3,966,569
140 3,966,570
149 3,966,571
159.16 3,966,572
159.23 3,966,573
159.24 3,966,574
180R 3,966,575
181 3,966,576
192 3,966,577
3,966,578
195B 3,966,580
195R 3,966,579
202 3,966,581

CLASS 206
108 3,966,041
344 3,966,042
423 3,966,043
427 3,966,044
443 3,966,045
445 3,966,046

CLASS 208
8 3,966,582
3,966,583
3,966,584
3,966,585
120 3,966,586
164 3,966,587
216 3,966,588
321 3,966,589

CLASS 209
39 3,966,590
73 3,966,591
75 3,966,047
82 3,966,048
121 3,966,049
462 3,966,592
479 3,966,593

CLASS 210
14 3,966,599
22R 3,966,594
24 3,966,596
39 3,966,597
44 3,966,598
46 3,966,600
53 3,966,601
83 3,966,602
86 3,966,603
104 3,966,604
130 3,966,605
136 3,966,606
137 3,966,607
151 3,966,608
198C 3,966,609
203 3,966,610
3,966,611
238 3,966,612
242R 3,966,614
3,966,615
242 3,966,613
433M 3,966,616
519 3,966,617

CLASS 211
10 3,966,050
14 3,966,051
60S 3,966,053
3,966,054
60T 3,966,052
65 3,966,055
134 3,966,056

CLASS 213
22 3,966,057

CLASS 214
1BB 3,966,058
8.5SS 3,966,059
35R 3,966,060
3,966,062
38D 3,966,061
83.36 3,966,063
131R 3,966,064
138R 3,966,065
146R 3,966,066
302 3,966,067
317 3,966,068
620 3,966,069
776 3,966,070

CLASS 215
260 3,966,071

CLASS 219
10.55B Re.28,888
3,967,087
10.55C 3,967,088
10.67 3,967,089
70 3,967,090
92 3,967,091
216 3,967,092
388 3,967,093
532 3,967,094

CLASS 220
1.5 3,966,075
3.8 3,966,073
3,966,074
7 3,966,072
20 3,966,076
70 3,966,077
85R 3,966,078
266 3,966,079
269 3,966,080
270 3,966,081
306 3,966,082
3,966,083
326 3,966,084
327 3,966,085

CLASS 221
234 3,966,086

CLASS 222
63 3,966,088
88 3,966,089
94 3,966,090
129.1 3,966,091
175 3,966,092
185 3,966,093
187 3,966,094
192 3,966,087
384 3,966,095
389 3,966,096
402.2 3,966,097
413 3,966,098
478 3,966,099

CLASS 223
92 3,966,100

CLASS 224
28R 3,966,101
45A 3,966,102
48R 3,966,103

CLASS 225
96 3,966,104

CLASS 226
21 3,966,105
42 3,966,106
59 3,966,107
114 3,966,108

CLASS 228
52 3,966,109
175 3,966,110

CLASS 229
15 3,966,111
23BT 3,966,112
40 3,966,113
44CB Re.28,882
51CE 3,966,114
55 3,966,115

CLASS 232
7 3,966,116

CLASS 233
19A 3,966,117

CLASS 235
92EA 3,967,095
92C 3,967,096
150.21 3,967,097
150.22 3,967,098
152 3,967,099
3,967,100
3,967,101
3,967,102
153AC 3,967,103
156 3,967,104
197 3,967,105

CLASS 237
2A 3,966,118
12.3B 3,966,119

CLASS 239
102 3,966,120
197 3,966,121
233 3,966,122
401 3,966,123
666 3,966,124

CLASS 240
1.3 3,967,106
1.4 3,967,107

CLASS 241
14 3,966,125
18 3,966,126
73 3,966,127
3,966,128
79.1 3,966,129
285R 3,966,130

CLASS 242
4BE 3,966,131
35.5A 3,966,141
36 3,966,132
42 3,966,133
55.19A 3,966,134
58.1 3,966,135
67.1R 3,966,136
75.43 3,966,137
84.2B 3,966,138
118.7 3,966,139
217 3,966,140

CLASS 244
12A 3,966,142
16 3,966,143
17.11 3,966,144

3,966,145
122A 3,966,146
135B 3,966,147

CLASS 246
34R 3,966,148
3,966,149
182B 3,966,150

CLASS 248
27R 3,966,152
62 3,966,154
73 3,966,155
201 3,966,156
217 3,966,157
243 3,966,158
250 3,966,159
311.3 3,966,160
459 3,966,161
487 3,966,162
500 3,966,163
512 3,966,153

CLASS 249
18 3,966,164
120 3,966,165
134 3,966,166
198 3,966,167

CLASS 250
201 3,967,108
3,967,109
3,967,110
206 3,967,111
213R 3,967,112
214C 3,967,113
236 3,967,114
251 3,967,115
298 3,967,116
323 3,967,117
325 3,967,118
326 3,967,119
328 3,967,120
330 3,967,121
367 3,967,122
368 3,967,123
372 3,967,124
432R 3,967,125
439 3,967,126
441 3,967,127
444 3,967,128
468 3,967,130
517 3,967,129
539 3,967,131

CLASS 251
58 3,966,168

CLASS 252
8.55D 3,966,618
32.5 3,966,619
33.4 3,966,620
42.7 3,966,621
46.6 3,966,622
47 3,966,623
52A 3,966,625
52R 3,966,624
73 3,966,626
99 3,966,627
135 3,966,628
140 3,966,629
180 3,966,630
299 3,966,631
309 3,966,632
373 3,966,633
3,966,634
413 3,966,635
419 3,966,636
429B 3,966,637
431R 3,966,638
439 3,966,639
440 3,966,640
449 3,966,641
455R 3,966,642
3,966,644
455Z 3,966,643
465 3,966,645
3,966,790
477R 3,966,646
500 3,966,987
522 3,966,647
3,966,648
542 3,966,649

CLASS 254
29R 3,966,169
175.7 3,966,170
190R 3,966,171

CLASS 256
12.5 3,966,172
13.1 3,966,173

CLASS 259
4R 3,966,174
8 3,966,175
108 3,966,176
185 3,966,177
3,966,178

CLASS 260
2.5AH 3,966,650
2.5EP 3,966,653
2.5HA 3,966,651
2.5N 3,966,652
24 3,966,654
29.2EP 3,966,657
29.2N 3,966,655
3,966,656
29.3 3,966,658
29.6MN 3,966,659
29.6F 3,966,660
29.7H 3,966,661
30.6R 3,966,662
31.4R 3,966,663
3,966,664
32.6N 3,966,666
32.8R 3,966,665
33.6UA 3,966,667
37EP 3,966,669
37N 3,966,668
38 3,966,670
40R 3,966,671
42.14 3,966,672
42.49 3,966,673
45.7R 3,966,674
45.75B 3,966,676
45.8NT 3,966,675
45.85T 3,966,677
47EA 3,966,679
47UA 3,966,678
47C 3,966,680
75NH 3,966,681
75H 3,966,682
77.5AC 3,966,683
77.5C 3,966,684
78A 3,966,686
78R 3,966,685
79 3,966,688
97.5 3,966,698
112.5TR 3,966,700
112.5R 3,966,699
3,966,701
123.5 3,966,702
146R 3,966,703
150 3,966,704
153 3,966,705
156 3,966,706
211.5R 3,966,707
236.5 3,966,708
239.1 3,966,709
3,966,710
239.3A 3,966,712
239.3R 3,966,711
239.55R 3,966,713
239.57 3,966,714
240A 3,966,715
243C 3,966,717
3,966,718
3,966,719
3,966,720
243R 3,966,716
3,966,721
244R 3,966,722
247.1L 3,966,723
247.5GP 3,966,724
248NS 3,966,725
249.8 3,966,726
249.9 3,966,727
3,966,728
250Q 3,966,729
251P 3,966,730
256.4C 3,966,732
256.4F 3,966,742
256.4Q 3,966,731
256.5R 3,966,733
267 3,966,734
268PC 3,966,736
268TR 3,966,737
268R 3,966,735
281GP 3,966,738
285.5 3,966,739
286R 3,966,740
287CF 3,966,743
292 3,966,744
293.53 3,966,745
293.54 3,966,747
293.6 3,966,746
294.8D 3,966,748
294.8G 3,966,741
295R 3,966,749
306.7C 3,966,752
306.7R 3,966,753
307FA 3,966,751
307B 3,966,750
308A 3,966,755
308D 3,966,756
308R 3,966,754
309.6 3,966,757
309.7 3,966,758
310A 3,966,759
310C 3,966,760
3,966,761
326D 3,966,762
326.5FN 3,966,763
326.85 3,966,764
327TH 3,966,765
327R 3,966,766
332.2A 3,966,767
338 3,966,768
340.5 3,966,769
3,966,770
347.8 3,966,771
348A 3,966,772
348C 3,966,773
378 3,966,774
3,966,775
396R 3,966,776
397.2 3,966,777
397.45 3,966,778
404 3,966,779
410.9N 3,966,780
410.9R 3,966,781
429R 3,966,595
438.1 3,966,782
439CY 3,966,783
448.2N 3,966,784
463 3,966,785
3,966,786
3,966,787
3,966,788
465.4 3,966,789
465.5R 3,966,791
468D 3,966,792
471A 3,966,793
471C 3,966,794
473A 3,966,795
482R 3,966,796
484A 3,966,797
486R 3,966,798
3,966,799
514G 3,966,800
515A 3,966,801
530N 3,966,802
534E 3,966,803
542 3,966,804
553A 3,966,805
558R 3,966,806
559AT 3,966,808
559D 3,966,807
559R 3,966,809
561N 3,966,810
562B 3,966,811
566D 3,966,812
570.6 3,966,813
3,966,814
570.8R 3,966,815
573 3,966,816
578 3,966,817
586F 3,966,819
586P 3,966,818
590FB 3,966,820
590R 3,966,821
593R 3,966,822
604R 3,966,823
609R 3,966,825
612R 3,966,824
613R 3,966,826
635E 3,966,827
639B 3,966,828
643B 3,966,829
646 3,966,830
650R 3,966,831
651F 3,966,832
668D 3,966,895
672R 3,966,833
681.5R 3,966,834
830P 3,966,835
835 3,966,836
837R 3,966,837
857UN 3,966,839
857R 3,966,838
860 3,966,840
873 3,966,841
3,966,842
874 3,966,843
876R 3,966,845
878R 3,966,844
884 3,966,846
885 3,966,847
930 3,966,848
937 3,966,849
940 3,966,850
949 3,966,851

CLASS 261
64R 3,966,854
92 3,966,859

CLASS 264
.5 3,966,852
13 3,966,853
65 3,966,855
71 3,966,856
75 3,966,857
91 3,966,858
94 3,966,860
95 3,966,861
110 3,966,862
118 3,966,912
137 3,966,864
147 3,966,865
171 3,966,866
210F 3,966,867
238 3,966,868
242 3,966,869
255 3,966,870
318 3,966,871

CLASS 266
158 3,966,180
193 3,966,179

CLASS 267
58 3,966,181
124 3,966,182
167 3,966,183

CLASS 269
37 3,966,184

CLASS 270
3,966,185
58 3,966,186

CLASS 271
3 3,966,187
9 3,966,188
34 3,966,189
42 3,966,190
125 3,966,191
147 3,966,192
150 3,966,193
186 3,966,194
189 3,966,195
218 3,966,196
260 3,966,197
265 3,966,198
275 3,966,199

CLASS 272
71 3,966,202
72 3,966,201
104 3,965,507
109 3,966,200
118 3,966,203
135 3,966,204

CLASS 273
29A 3,966,205
43E 3,966,206
73D 3,966,207
101 3,966,208
130R 3,966,209
134GM 3,966,211
169 3,966,210
181A 3,966,212
201 3,966,213
207 3,966,214

CLASS 274
10S 3,966,215
25 3,966,216

CLASS 279
59 3,966,217

CLASS 280
79.3 3,966,221
261 3,966,229
281R 3,966,230
477 3,966,231
611 3,966,219
618 3,966,218
638 3,966,220
685 3,966,222
712 3,966,223
735 3,966,224
737 3,966,225
3,966,226
3,966,228
752 3,966,227

CLASS 283
23 3,966,232

CLASS 285
24 3,966,234
25 3,966,235
39 3,966,236
112 3,966,237
239 3,966,238
316 3,966,239
367 3,966,240

CLASS 289
1.2 3,966,241

CLASS 290
4R 3,967,132

CLASS 292
19 3,966,242
40 3,966,243
127 3,966,244
202 3,966,245
241 3,966,246
318 3,966,247
340 3,966,248

CLASS 294
88 3,966,249

CLASS 296
1R 3,966,250

CLASS 297
267 3,966,251
306 3,966,252
367 3,966,253

CLASS 298
22C 3,966,254
35M 3,966,255

CLASS 299
33 3,966,256
76 3,966,257
3,966,258

CLASS 300
21 3,966,259

CLASS 301
127 3,966,260

CLASS 302
14 3,966,261
15 3,966,262

CLASS 303
6C 3,966,263
21AF 3,966,265
21BE 3,966,264
3,966,267
21P 3,966,266
24F 3,966,268
37 3,966,269
69 3,966,270
3,966,271
81 3,966,272

CLASS 307
10R 3,967,133
115 3,967,134
121 3,967,135
221D 3,967,136
235R 3,967,137
252J 3,967,138
270 3,967,139
286 3,967,140

CLASS 308
3.8 3,966,273
8.2 3,966,274
15 3,966,275
36 3,966,277
72 3,966,278
160 3,966,279
176 3,966,280
202 3,966,281
207R 3,966,282
235 3,966,284
238 3,966,276

CLASS 310
8.1 3,967,143
8.3 3,967,142
8.7 3,967,141
10 3,967,144
52 3,967,145
80 3,967,146
162 3,967,147
239 3,967,148

CLASS 312
214 3,966,283
257R 3,966,285
258 3,966,286

CLASS 313
141 3,967,149
338 3,967,150
398 3,967,151
435 3,967,152
489 3,967,153

CLASS 315
39.51 3,967,154
39.55 3,967,155
101 3,967,156
169TV 3,967,157
3,967,158
247 3,967,159

CLASS 316
1 3,966,287
19 3,966,288

CLASS 317
33SC 3,967,169
68 3,967,160
101CM 3,967,162
101R 3,967,161
112 3,967,163
114 3,967,164
120 3,967,165
141S 3,967,166
242 3,967,167
258 3,967,168

CLASS 318
85 3,967,170
158 3,967,171
227 3,967,172
3,967,173
254 3,967,174
258 3,967,175
603 3,967,176
3,967,177
648 3,967,178
696 3,967,179

CLASS 320
13 3,967,180

CLASS 321
2 3,967,181
18 3,967,182
45C 3,967,183
3,967,184
61 3,967,185

CLASS 322
28 3,967,186

CLASS 323
4 3,967,187
75B 3,967,188
76 3,967,189

CLASS 324
1 3,967,190
20R 3,967,191
21 3,967,192
37 3,967,193
3,967,194
51 3,967,195
54 3,967,196
61R 3,967,197
72 3,967,198
158MG 3,967,199
173 3,967,200

CLASS 325
28 3,967,201
31 3,967,202
349 3,967,203
473 3,967,204

CLASS 328
46 3,967,205
206 3,967,206

CLASS 330
23 3,967,207
35 3,967,208
86 3,967,209

CLASS 331
56 3,967,210
94.5PE 3,967,214
94.5C 3,967,213
94.5P 3,967,212
94.5R 3,967,215
94.5S 3,967,211
111 3,967,216

CLASS 332
9R 3,967,217

CLASS 333
1.1 3,967,218
14 3,967,219
28R 3,967,220
30R 3,967,221
70CR 3,967,222
82B 3,967,223

CLASS 335
151 3,967,224
210 3,967,225

CLASS 336
84 3,967,226

CLASS 337
124 3,967,227
248 3,967,228

CLASS 338
13 3,967,229
66 3,967,230
117 3,967,231

CLASS 339
4 3,966,289
17LC 3,966,290
64R 3,966,291
91P 3,966,292
103R 3,966,293
153 3,966,294
176MF 3,966,295
263R 3,966,296

CLASS 340
2 3,967,232
3R 3,967,233
8R 3,967,234
15.5DS 3,967,235
27AT 3,967,236
52E 3,967,237
59 3,967,238
63 3,967,239
73 3,967,240
146.3H 3,967,241
3,967,242
3,967,243
171PF 3,967,244
172.5 3,967,245
3,967,246
3,967,247
3,967,248
3,967,249
3,967,250
3,967,251
3,967,263
173LM 3,967,253
173R 3,967,252
3,967,254
227R 3,967,255
242 3,967,256
253R 3,967,257
258A 3,967,260
258B 3,967,258
258C 3,967,261
258D 3,967,259
258R 3,967,262
310A 3,967,264

324AD	3,967,266
	3,967,268
324M	3,967,267
324R	3,967,265
347AD	3,967,269
347DA	3,967,272
347NT	3,967,270
347P	3,967,271
365S	3,967,273
380	3,967,274
415	3,967,281
CLASS 343	
5NA	3,967,282
7.7	3,967,283
9	3,967,284
105R	3,967,277
108R	3,967,278
117A	3,967,279
121	3,967,280
713	3,967,275
752	3,967,276
CLASS 346	
74E	3,967,285
140R	3,967,286
CLASS 350	
23	3,966,298
52	3,966,297
96B	3,966,300
96C	3,966,299
128	3,966,301
160LC	3,966,302
	3,966,303
	3,966,304
	3,966,305
214	3,966,306
216	3,966,307
293	3,966,308
310	3,966,309
CLASS 351	
16	3,966,310
164	3,966,311
CLASS 352	
91C	3,966,312
173	3,966,313
CLASS 353	
27R	3,966,314
101	3,966,315
CLASS 354	
56	3,967,287
60L	3,967,288
83	3,967,297
	3,967,304
125	3,967,289
153	3,967,298
154	3,967,290
171	3,967,291
174	3,967,292
219	3,967,299
252	3,967,293
288	3,967,300
292	3,967,301
295	3,967,302
	3,967,303
CLASS 355	
3R	3,966,316
19	3,966,317
64	3,966,318
66	3,966,319
73	3,966,320
121	3,966,321
CLASS 356	
39	3,966,322
96	3,966,323
106R	3,966,324
114	3,966,326
138	3,966,327
	3,966,328
152	3,966,329
156	3,966,330
164	3,966,331
197	3,966,332
218	3,966,325
229	3,966,333
CLASS 357	
3	3,967,305
24	3,967,306
35	3,967,307
38	3,967,294
	3,967,308
49	3,967,309
51	3,967,295
54	3,967,310
80	3,967,296
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DESIGN PATENTS

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36 : 240,353
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42 : 240,351
44 : 240,350
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PLANT PATENTS

6 : 3,928
3,929
53 : 3,927

U. S. GOVERNMENT PRINTING OFFICE : O - 1976

U.S. DEPARTMENT OF COMMERCE

Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE

C. Marshall Dann, *Commissioner*